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A LOGICAL LOOK AT SPECIAL ISSUE CONFLICTS

by: Kevin W. Saunders*

In the United States, there are four methods for submitting a case to a jury: (1) the general charge, (2) submission of factual issues for a special verdict, (3) the general charge with interrogatories on some issues, and (4) submission of the whole case as a series of interrogatories.¹ The last of these four methods, known as "special issue submission,"² has a long history in Texas civil procedure.³ The basis for such submission is found in the former Rule 277 of the Texas Rules of Civil Procedure. The rule stated:

In all jury cases the court may submit said cause upon special issues without request of either party, and, upon request of either party, shall submit the cause upon special issues controlling the disposition of the case that are raised by the written pleadings and the evidence in the case, except that for good cause subject to review or on agreement of the parties, the court may submit the same on a general charge.⁴

While it is "discretionary with the court whether to submit separate questions with respect to each element of the case or to submit the

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1. Dooley, *The Use of Special Issues Under the New State and Federal Rules*, 20 TEX. L. REV. 32, 32 (1941) [hereinafter Dooley].

2. In distinguishing special verdicts and special issue submission, Dooley notes that "[i]n the early Texas procedure the special verdict commonly was in the form of a narrative finding of facts, unlike the question and answer technique of our present special issue procedure and more similar in form to findings of fact made by the court in a non-jury case." Dooley, *supra* note 1, at 32.

3. See Note, *The Scope of Special Issues in Negligence Cases: Pleadings, Proof, and Rule 277*, 15 HOUSTON L. REV. 735, 736-37 (1978) [hereinafter Note, *The Scope of Special Issues*] ("the practice of submission in a question and answer format similar to contemporary special issue practice was recognized at least as early as 1876"). For a partial history of special issue submission leading to alleged conflicts, see *infra*, note 12 and accompanying text.

4. Tex. R. Civ. P. 277 (Vernon Supp. 1986). While this article was in press, Rule 277 was amended to provide that "[i]n all jury cases the court shall, whenever feasible, submit the cause upon broad-form questions. The court shall submit such instructions and definitions as shall be proper to enable the jury to render a verdict." 50 TEX. B. J. 865 (1987). The inclusion of the phrase "whenever feasible" certainly still allows for the submission of special issues, and it is not at all clear that the amendment will cut significantly into the practice.

issues broadly,"⁵ and while even a negligence question might now be submitted as a global issue,⁶ there are still arguments to be made for special issue submission,⁷ and cases continue to be submitted in that form.⁸

The history of special issue submission has been accompanied by a long history of problems resulting from that form of submission. In a 1942 article, J.B. Dooley, a member of the Texas Supreme Court Advisory Committee on Rules of Procedure, cataloged four chief complaints: (1) the progressive multiplication of issues, (2) conflicts between jury findings, (3) problems of omitted issues, and (4) difficulties drawing lines between general charges and special issues.⁹ By 1953, a former President of the Texas Bar, in re-examining Dooley's four complaints, was able to conclude that "[w]hile we have by no means eliminated all of these objections, it is quite evident that we have made considerable progress."¹⁰ With regard to the one complaint to be addressed in this article, it was said: "Since our trial judges are now privileged to retire a jury for further deliberations, upon perceiving that conflicting answers may have been made, we are not too much plagued by this. The court may now call the attention of the jury to the conflict and retire them for further deliberations."¹¹ Despite this assurance, the line of cases in which an appellate court has been called upon to resolve a dispute over the existence and effect of a conflict between responses to special issues has continued from before 1942, through the 1953 claim of having the problem in hand, through the 1973 amendments,¹² and continues into the current decade.

5. *Id.*

6. See Spradley, *The Global Issue: Outlaw of the Special Issue Practice*, 18 HOUSTON L. REV. 1, 1-5 (1980) [hereinafter Spradley] (discussing the effect of the 1973 amendments to Rule 277).

7. See *id.* at 14-40 (arguing against the submission of global issues).

8. See *infra* note 12 for older, as well as more recent, cases in which special issues were submitted and a question of conflict arose.

9. See Dooley, *supra* note 1, at 34-35 (also noting that "new" rules, effective in 1941, took measures to remedy the problems).

10. Jones, *Special Issue Submission*, 16 TEX. B.J. 285, 285 (1953) [hereinafter Jones].

11. *Id.* at 340.

12. See, e.g., Huber v. Ryan, 627 S.W.2d 145 (Tex. 1981); Producers Chem. Co. v. McKay, 366 S.W.2d 220 (Tex. 1963); Traywick v. Goodrich, 364 S.W.2d 190 (Tex. 1963); Indemnity Ins. Co. v. Craik, 162 Tex. 260, 346 S.W.2d 830 (1961); Bradford v. Arhelger, 161 Tex. 427, 340 S.W.2d 772 (1960); Texas & P. R.R. Co. v. Snider, 159 Tex. 380, 321 S.W.2d

This article will address the problem of conflicts between or among responses to special issue submissions.¹³ Section I will demonstrate the inadequacy of standard propositional logic in identifying and examining contradictions between or among findings of fact.¹⁴ Section II will present a logic that does not face the inadequacies of propositional logic with regard to fact finding.¹⁵ Section III will discuss, in theoretical terms, the application of the logic presented in Section II;¹⁶ and in Sections IV and V the logic will be applied to the reasoning of several appellate cases examining conflicting findings.¹⁷

Even if practitioners and courts do not use the formal methods discussed, an understanding of the discussion should lead to better informal examination of potential conflicts. Furthermore, an understanding of the logical relationships between findings of fact might help alleviate the problems presented by the multiplication of special issues¹⁸ and the failure to submit necessary issues.¹⁹

I. THE INADEQUACY OF PROPOSITIONAL LOGIC

One difficulty in determining whether jury findings in response to the submission of special issues conflict may well be the inadequacy of standard logic in analyzing the possible conflict. Similarly, that logical inadequacy may be at the root of the inartful drafting of special issues that leads to seemingly conflicting findings.²⁰

280 (1959); *Meacham v. Loving*, 155 Tex. 279, 285 S.W.2d 936 (1956); *Little Rock Furniture Mfg. Co. v. Dunn*, 148 Tex. 197, 222 S.W.2d 985 (1949); *A.B.C. Stores, Inc. v. Taylor*, 136 Tex. 89, 148 S.W.2d 392 (1941); *Lewis v. Yaggi*, 584 S.W.2d 487 (Tex. Civ. App.—Tyler 1979, writ ref'd n.r.e.); *Norris v. Branham*, 557 S.W.2d 816 (Tex. Civ. App.—El Paso 1977, writ ref'd n.r.e.); *Rhoades v. Castillo*, 488 S.W.2d 528 (Tex. Civ. App.—Waco 1971, writ ref'd n.r.e.); *Billingsley v. Southern Pac. Co.*, 400 S.W.2d 789 (Tex. Civ. App.—Tyler 1966, writ ref'd n.r.e.).

13. While not all of the cases presented in note 12 will be analyzed, the methods presented could be applied to the remaining cases.

14. See *infra* notes 20-34 and accompanying text.

15. See *infra* notes 35-89 and accompanying text.

16. See *infra* notes 90-108 and accompanying text.

17. See *infra* notes 109-87 and accompanying text.

18. See *supra* text accompanying note 9. A failure to understand how special issues interrelate may lead, through an abundance of caution, to the submission of unnecessary issues. This, of course, has the further effect of increasing the likelihood of some of the issues conflicting.

19. *Id.* A failure to appreciate the logical relationships between various elements of the cause of action might be a factor in the failure to submit a necessary issue.

20. See *supra* notes 18-19 and accompanying text.

The inadequacy of propositional logic is explained by the probabilistic nature of fact findings. The jury, in finding a fact, is asserting that the fact in question has been established with a certain degree of probability,²¹ the degree of probability required being determined by the nature of the proceeding.²² If multiple findings of fact are to be analyzed together, or inferences are to be drawn from findings of fact, the logic in which the analysis is performed, or in which the inferences are drawn, must take into account the probabilistic nature of the propositions involved. As the examples that follow show,²³ propositional logic fails to appreciate the difficulties inherent in working with probability based propositions.

For example, consider the case in which a jury is willing to find as fact some proposition p and also find as fact a proposition q . If findings of fact are identified with the true propositions on which logic operates, then a problem arises. From the truth of p and the truth of q , the truth of p and q may be inferred in propositional logic, therefore, it could be concluded that the jury would have to be willing to find as fact the proposition p and q .

Consider, however, the following fact setting. An exhibition takes place for which 400 persons have paid admission, but 1,000 are counted in the seating area. No tickets were issued, so there is no way to distinguish gate crashers from those who have paid. If a person is chosen at random from those in attendance, the probability is 0.6 that the person is a trespasser.²⁴

Suppose also, that after the exhibition ends and the crowd heads for the exit, a quick check of the stands shows that sixty percent of the chairs have been damaged solely as a result of having been used as seats. The defendant was identified as having been in attendance and suit is brought for damage to a chair.

21. For a discussion of the various concepts of probability and their application to legal analysis, see L. COHEN, *THE PROBABLE AND THE PROVABLE* (1977) [hereinafter COHEN].

22. If numerical values are to be attached to the levels of probability necessary for a finding, anything in excess of 0.5 would appear to correspond to the normal civil suit standard of "more probable than not" or "by a preponderance". No such neat assignment jumps to the forefront for proof by "clear and convincing evidence" or proof "beyond a reasonable doubt". Whatever value is chosen below the complete certainty represented by a probability of 1.0, the problems raised by the examples will, with some change of figures, remain problems.

23. For further discussion of the problems involved in the marriage of probability and judicial reasoning, see COHEN, *supra* note 21, at 49-120.

24. This is the "gatecrasher" problem presented by COHEN, *supra* note 21, at 74-76.

The issues in dispute are trespass and damage. On purely probabilistic grounds, the jury should find it more probable than not that defendant was a trespasser, and the jury should also find it more probable than not that the chair defendant used was damaged.²⁵ However, even having found each of the conjuncts, the jury would not be justified in finding that *Defendant was a trespasser and he damaged a chair*. Assuming there is no correlation between trespass and damage to one of the chairs, that is, that the events are independent, the probability of the defendant being in both groups, trespassers and chair damagers, is the product of the probability of being a trespasser, 0.6, and the probability of being a chair damager, also 0.6. The probability of defendant's liability is then 0.36,²⁶ and the jury is not, on probabilistic grounds, justified in finding the conjunction.

A similar, but more complex problem is presented by a situation in which the jury has found as fact *p or q* and has also found as fact *not-q*.²⁷ If the two findings are taken as true propositions in

25. Cohen presents the gatecrasher problem to show the difficulty in analyzing legal probability from a mathematician's point of view. It does indeed seem odd that the legal system might find liability based on purely statistical evidence of this sort, *see also* Brilmayer & Hornhauser, *Review: Quantitative Methods and Legal Decisions*, 46 U. CHI. L. REV. 116 (1978); Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329 (1971), *but see* Kaye, *The Laws of Probability and the Law of the Land*, 47 U. CHI. L. REV. 34 (1979), especially in light of the fact that the same analysis might be used to prove, in independent trials, that each person in attendance was liable, whereas forty percent are in fact not liable because they did not trespass, and perhaps as many as two-thirds of the trespassers are not liable because they did not damage their chairs, so that eighty percent of those in attendance would not in fact be liable, but each could be found liable.

The mathematician's view was employed here, despite Cohen's finding of fault, because it more clearly presents the problem raised by conjoining findings of fact and claiming that the conjunct has been found. Whatever approach to probability is used, the probability of a conjunction will be less than the probability of either conjunct, and finding each conjunct will not entail a finding of the conjunction.

26. Where two events are independent, that is, the occurrence of one having no effect on the probability of the occurrence of the other, the probability of both happening is the product of the probabilities of the individual events. Where events are not independent, the probability of (A and B) occurring is the probability of A multiplied by the probability of (B given that A has occurred). Unless B always occurs when A occurs, the probability of (B given that A has occurred) will be less than one, and the probability of the conjunction will be less than either conjunct. While the figures found in the example in the text would have to be adjusted, the same problems would arise.

27. It should be noted that there is a difference between a finding of *not-q* and a failure to find *q*. The difference is not important to this example, but it will be discussed *infra* at notes 149-51 and accompanying text.

propositional logic, the truth of p may be inferred, so the jury would be taken to have implicitly found p . However, as the following example shows, when the probabilistic nature of the findings is taken into account, the inference is invalid.

Suppose that three persons each drive identical golf balls in the direction of the parking lot at a public park and that it is negligent to do so. Having seen the balls veer or hook into the lot, none of the golfers goes to retrieve his ball. Later, two of the balls are found lying in empty parking stalls, apparently having done no damage. The third is found on the front seat of a locked automobile, the windshield of which is smashed. A, B, and C are identified as the persons who drove the golf balls, and the owner of the automobile files suit against A. Negligence is admitted, and the only issue is causation.

Let p , q , and r represent the propositions *A's golf ball broke the windshield*, *B's golf ball broke the windshield*, and *C's golf ball broke the windshield*, respectively. If A, B, and C are all equally likely to have driven the ball that did the damage, and it is accepted that no one else was involved, then the probability that each was the one who drove the errant ball is one-third. The probability that (A's golf ball broke the windshield or B's golf ball broke the windshield) would then be two-thirds,²⁸ and a jury would be justified on probabilistic grounds in finding p or q .²⁹ Furthermore, the probability that B's golf ball did not break the windshield, i.e., the probability of $\text{not-}q$, is two-thirds,³⁰ so that the jury would be justified, on probabilistic grounds, in finding $\text{not-}q$.³¹ However, the jury would not be justified in finding p , since the probability of p is only one-third. In fact, the jury would be justified, on probabilistic grounds,³² in finding $\text{not-}p$, as well as $\text{not-}r$.³³

28. The probability of (p or q) is the probability of p plus the probability of q minus the probability of (p and q); that is:

Probability (p or q) = Probability p + Probability q - Probability (p and q).

Where p and q cannot both occur, the probability of (p and q) is zero, and the probability of (p or q) equals the probability of p plus the probability of q , here, one-third plus one-third or two-thirds.

29. Again, one may question the wisdom of establishing liability on purely statistical grounds, see *supra* note 25, but whatever concept of probability is employed, the example in the text will present a problem.

30. The probability of $\text{not-}q$ is one minus the probability of q , here, one minus one-third or two-thirds.

31. But see *supra* notes 25 & 29.

32. But see *supra* notes 25 & 29.

33. Burden of proof assignment and the requirement of a positive showing to establish

Clearly, findings of fact may not be treated as the true propositions of propositional logic. However, the conclusion of this section should not be that propositional logic must be totally abandoned in analyzing fact-finding, merely that it must be extended. Propositional logic does have application, but one must be careful in applying its rules. If a jury has found p and has found q , then it is legitimate to say " p is found and q is found." Illegitimacy results only when one attempts to conclude that p and q is found.

The difference might be clarified by employing symbols. Let Fp represent ' p is found' or ' p must be taken as found'; and let Fq represent ' q is found' or ' q must be taken as found'; and let $F(p \text{ and } q)$ represent ' p and q is found' or ' p and q must be taken as found', etc. Further, in place of *and* substitute $\&$. The difference may then be stated that from Fp and Fq it is permissible to infer $Fp \& Fq$, but it is not permissible to infer $F(p \& q)$.

Similarly, in the second example, if it was known that the jury had found p or had found q , and it was known that the jury had not found q , it would be proper to conclude that the jury had found p . In symbols, using V to represent *or*, from $Fp \vee Fq$ and $\text{not-}Fq$ it is permissible to infer Fp . The mistake in the example was an attempt to infer Fp from $F(p \vee q)$ and $F(\text{not-}q)$.

Propositional logic may be used to build up or break down complex statements that combine individual findings. That is, from $Fp \& Fq$, one may infer Fp , and from Fq one may infer $Fp \vee Fq$. However, it is not proper to use propositional logic-like rules to build up or break down complex findings from or to individual findings; for example, to infer $F(p \& q)$ from Fp and Fq or to infer Fq from $F(p \vee q)$ and $F(\text{not-}p)$. Yet it is the ability to combine and dismantle findings and obtain other findings that is necessary for an adequate analysis of fact findings. The next section provides an extension of propositional logic³⁴ providing this ability and the capacity to analyze fact finding.

liability make this result reasonable in a way that the gatecrasher result of finding everyone present to be a gatecrasher, *see supra* notes 24-25 and accompanying text, is not.

34. An extension of a logic is a system in which everything that was provable in the first logic remains provable and in which additional theorems may also be proved. *See, e.g.,* A. HAMILTON, LOGIC FOR MATHEMATICIANS 38 (1978) ("[a]n *extension* of L is a formal system obtained by altering or enlarging the set of axioms so that all theorems of L remain theorems (and new theorems are possibly introduced).") (emphasis in original).

II. A LOGIC OF FINDINGS

The examples from the last section, showing the inadequacy of propositional logic in analyzing findings of fact,³⁵ also provide some insight into what is necessary for a logic to be adequate. A finding of *p* and *q* could not be inferred from findings of *p* and of *q*, because the probability of the conjunction was less than or equal to the probability of each conjunct.³⁶ If the probability was less than either conjunct,³⁷ then the probability of the conjunction might have fallen below the level required for a finding. Nonetheless, if the probability of a proposition is above the level required for a finding, there may be other propositions of sufficiently high probability that they could be conjoined with the finding, and the conjunction would be of sufficient probability to be taken as a finding.³⁸ The difficulty in applying this fact to findings is that the precise probability of the finding is unknown,³⁹ and, therefore, it is also unknown how high the probability of the proposition to be conjoined must be.

The only propositions that may be known to be of sufficiently high probability are those that express certainties,⁴⁰ that is, those that are necessarily true. If a proposition is necessarily true, its probability may be taken as equal to one.⁴¹ When such a proposition is conjoined with a finding of fact, the probability of the conjunct is equal to

35. See *supra* notes 24-34 and accompanying text.

36. See *supra* note 26.

37. The probability of the conjunction will be less than either conjunct, unless the probability of one of the conjuncts is equal to one.

38. If proof is by a preponderance, and the probability of *p* is *x*, then the probability of *q* need only exceed 0.5 divided by *x* for the probability of (*p*&*q*) to exceed 0.5 and for (*p*&*q*) to then be taken as found.

39. Knowing that *p* is found merely assures that its probability has been found to exceed some value, for example, one-half in the case of proof by a preponderance, but does not indicate by how much the minimal value is exceeded.

40. If one is to be assured that a proposition *p* may be conjoined with a finding *q* and that the conjunction will have sufficient probability to be taken as a finding, it must be assumed that *q* has the minimal probability required for a finding. As the probability of *q* is taken to have values closer and closer to, but greater than 0.5, the probability of *p* must become closer and closer to 0.5 divided by that value. See *supra* note 38. That is, the probability of *p* must be closer and closer to one.

41. If probability is viewed as expressing relative frequency, then where *p* is necessarily true, it must occur on every repetition, and the probability of *p* will be one. Similarly, if probability is viewed as expressing a degree of belief, and if the values assigned to the degree of belief remain between zero and one inclusive, those that are necessary must be assigned the highest degree of belief and thus must be assigned the probability of one.

the probability of the conjoined finding, and the conjunction may be taken as found.⁴² Similarly, if p or q is found as fact, and $not-q$ is necessary, then the probability of q made no contribution toward increasing the probability of p or q . The probability of p or q is equal to the probability of p , and p may be taken as found.⁴³

The need to employ necessary truth in analyzing findings of fact leads in the direction of developing a system of modal logic.⁴⁴ Such a system will be presented in this section,⁴⁵ but first, more must be said about what is to be considered a necessary truth.

There are at least three ways in which to view necessary truth. The logician, D. Paul Snyder, discusses logical necessity, conceptual necessity, and theoretical necessity.⁴⁶ A proposition is logically necessary if and only if it is mandated by the laws of logic.⁴⁷ If the necessity to be employed in analyzing findings of fact were to be taken as logical necessity, the logic would be lacking in analytic power, and little of interest would result. Only tautologies could be combined with findings of fact. Even definitions of legal terms such as "trespass" and "negligence" could not be combined with findings to produce other findings, since in such definitions the definiens and definiendum are not tautologically equivalent.

Snyder's conceptual necessity is more promising in that it at least allows for legal definitions to function as necessary propositions. Conceptual necessity arises from the way in which terms are used in a language or linguistic context.⁴⁸ For example, in law, the term "trespass" is limited to situations in which the property in question

42. In such a case, the probability of $p \& q$ equals the probability of p multiplied by one. See *supra* note 26. Since the probability of $p \& q$ equals the probability of p , if p is found, so is $p \& q$.

43. The probability of $p \vee q$ equals the probability of p plus the probability of q minus the probability of $p \& q$. If $not-q$ is necessary, then q is impossible. See *infra* note 75 and accompanying text. Therefore, its probability must be taken as equal to zero. Furthermore, if q is impossible, then so must be $p \& q$, and thus the probability of $p \& q$ also equals zero. Hence, the probability of $p \vee q$ equals the probability of p plus zero minus zero, or simply, the probability of p .

44. Modal logic is the logic of necessity and possibility. See generally C. LEWIS & C. LANGFORD, *SYMBOLIC LOGIC* (1932) (providing a comprehensive method for developing a system of modal logic); G. VON WRIGHT, *AN ESSAY IN MODAL LOGIC* (1951).

45. See *infra* notes 57-89 and accompanying text.

46. D. SNYDER, *MODAL LOGIC AND ITS APPLICATIONS* 167-78 (1971) [hereinafter SNYDER].

47. Snyder defines logical possibility rather than logical necessity and defines that possibility as "requiring only that no logical rules be violated." *Id.* at 167.

48. See *id.* at 168-70.

is not in the legal possession of the trespasser.⁴⁹ Hence, it is conceptually necessary that if X trespassed on particular property, then X was not the legal possessor of the property. However, the same implication is not logically necessary.⁵⁰ Since an analysis of fact finding must occur within the context of instructions to the jury defining legal terms, conceptual necessity appears superior to logical necessity for the task at hand.

Even conceptual necessity may not go far enough to provide the necessary analytic tools. It is not conceptually necessary that the sun rise in the east,⁵¹ yet it would seem reasonable that the system allow the inference that where two automobiles were oncoming, and the jury has found that one car was headed into the sunrise, the other was westbound. To allow such an inference requires that the concept of necessity be expanded⁵² to include propositions that are theoretically necessary. Theoretically necessary propositions are those that are mandated by physical or scientific theory.⁵³ Under such a view, driving into the sunrise and driving eastward (with various *caveats* regarding latitude and time of year) are necessarily equivalent.

Having recognized that there may be some need to employ theoretical necessity, rather than limiting that analysis to logical or conceptual necessity, a word of caution is required. From a logical point of view, the theory on which theoretical necessity is based is irrelevant. So long as the premises of the theory are stated, other propositions may be found to be theoretically necessary. It is obviously important to restrict the theories that may serve as the basis for establishing theoretically necessary propositions to well-accepted scientific or physical theories. If a proposition that is not logically

49. See, e.g., W. PROSSER, LAW OF TORTS 68-69 (4th ed. 1971).

50. Logical necessity does not arise from looking inside the logical particles — the simple or atomic propositions. Rather, it results from relations between those atomic propositions and complex propositions built up from them. For example, it is logically necessary that $(p \& q)$ implies p . Relations between complex propositions also create logical necessity. For example, it is logically necessary that $(p \& q)$ implies $(p \vee q)$. There is no logically necessary relation between p and q simply because the predicates they contain are related through some linguistic convention.

51. It is not a linguistic convention that "east" and "place where the sun rises" denote the same direction. The terms are not related in the same way that "bachelor" and "unmarried man" are. Rather, it is scientific theory and induction that allow the claim that it is theoretically necessary that the terms are equivalent.

52. For the sense in which this is an expansion, see *infra* note 55 and accompanying text.

53. See SNYDER, *supra* note 46, at 175.

or conceptually necessary must be taken as necessary in a particular analysis of fact finding, the question of whether or not the proposition may be taken as necessary in the analysis should turn on whether a reasonable juror, given the generally accepted view of the physical world, *must* take the proposition as true.⁵⁴ If so, the proposition is theoretically necessary.

While three different sorts of necessity have been identified, fortunately, it is not required that the three be kept distinct in analyzing fact finding. The three varieties are related in that any logically necessary proposition is conceptually necessary, and any conceptually necessary proposition is theoretically necessary.⁵⁵ Hence, for purposes of this effort, the modifiers may be dropped, and a proposition will be considered necessary if it is either logically necessary, conceptually necessary, or necessary under well-accepted scientific or physical theories.

Having explicated the concept of necessity, we may now turn to the presentation of a logic that allows for the combination of necessary propositions and those found as fact to derive other propositions that may also be taken as found as fact.⁵⁶ In so doing, a certain amount of symbolization will be beneficial. *Fp*, *Fq*, etc. will be read '*p*' is found, '*q*' is found, etc. *Lp*, *Lq*, etc. will be read '*p*' is necessary, '*q*' is necessary, etc. In addition, symbols will be used to represent the various propositional connectives. The symbol & has already been chosen to represent *and*, while *V* has been chosen to represent *or*. Implication will be represented by \rightarrow , so $p \rightarrow q$ will be read as "*p* implies *q*" or "if *p*, then *q*." Material equivalence will

54. This standard should be viewed as more restrictive than the standard for review of factual findings by an appellate court. Such review is with regard to the evidence offered in the individual case, where the evidence may have been in some conflict. In the case of necessary propositions, there should be a limitation to general statements of scientific or physical laws or the application of such laws to uncontested facts.

55. Assuming that conceptualizations are more than mere word games, one can no more conceive of an unmarried male who is not a male than conceive of an unmarried male who is not a bachelor. Likewise, if necessity is based on the way in which predicates are used, the necessity must also be a theoretical necessity in any theory using the terms in their normal way. Snyder recognizes that it may at times be difficult to decide whether possibility (and thus necessity) is conceptual or theoretical; however, he argues for the nested relation among the types of possibility (and thus necessity). See SNYDER, *supra* note 46, at 176.

56. The logic to be presented informally here and applied to special issue analysis is one of the logics developed formally for application to collateral estoppel analysis in Saunders, *A Logic for the Analysis of Collateral Estoppel*, 12 RUTGERS COMP. & TECH. L.J. 99 (1986) [hereinafter Saunders].

be represented by \leftrightarrow , and $p \leftrightarrow q$ will be read as "p if and only if q." Lastly, the negation of p will be symbolized as $\sim p$. Where compound propositions become sufficiently complex, parentheses will be employed to indicate the order in which connectives operate.

For the logic to retain the analytic power enjoyed by propositional logic, the system must contain some formulation of that logic. Since the formal development and the distinctions between axioms and theorems are unimportant to the analysis at hand and are easily found elsewhere,⁵⁷ they will not be dealt with here. However, various aspects of propositional logic are important and are simply presented here without proof.⁵⁸

The following express relationships between the propositions of propositional logic. They are labelled "PC1," "PC2," etc. for later ease of identification.

PC1 $p \& q$ is true if and only if p and q are both true.

PC1 may be viewed either as presenting a definition of how the connective $\&$ operates or as presenting a combination of inference schemes under which it is permissible to infer, from both p and q , $p \& q$ and to infer from $p \& q$ either p or q .

PC2 $p \vee q$ is true if and only if either p is true or q is true.⁵⁹

Similarly, PC2 may be viewed as a definition of \vee or as an inference scheme that allows the inference of $p \vee q$ from either p or q .

PC3 $p \rightarrow q$ is true unless p is true and q is false.⁶⁰

57. See, e.g., I. COPI, INTRODUCTION TO LOGIC 243-70 (3d ed. 1968); P. SUPPES, INTRODUCTION TO LOGIC 1-42 (1957).

58. In any formal development of propositional logic, some theses will be taken as axioms and will remain unproved. Here, no attempt is made to distinguish the axioms from theorems, or for that matter the theses (axioms and theorems) from inference schemes or definitions of the connectives.

59. This is the non-exclusive use of *or*. The exclusive *or* may be represented in the logic as $(p \vee q) \& \sim (p \& q)$.

60. The implication indicated is a material implication in which there need not be any connection between the antecedent and consequent other than that the former not be true while the latter is false. Certain unhappiness with material implication, in that a logically contradictory proposition implies any other proposition and a logically necessary proposition is implied by any other proposition, has been a factor in the development of the modal logic systems on which the logic presented here is built.

PC3 is best viewed as a definition of \rightarrow , although the inference schemes known as *modus ponens* and *modus tollens*, presented as PC6 and PC7, respectively, are based on the definition presented as PC3.

PC4 $p \leftrightarrow q$ is true if and only if p and q are both true or both false. Alternatively, $p \leftrightarrow q$ is true if and only if $p \rightarrow q$ and $q \rightarrow p$ are both true.

Again, PC4 serves not only as a definition, but also allows the inference of either implication from the equivalence or biconditional and the equivalence or biconditional from the two implications taken together.

PC5 $\sim p$ is true if p is false and is false if p is true.⁶¹

PC5 presents the relationship between a proposition and its negation. It is more purely definitional than PC1 through PC4, although it too may serve as the basis for an inference of p from $\sim \sim p$, or of $\sim \sim p$ from p , as in PC20.

PC6 through PC10 are non-definitional but present inference schemes for deriving a true proposition from the truth or falsity of other propositions.

PC6 If $p \rightarrow q$ and p are both true, then q is true.⁶²

PC7 If $p \rightarrow q$ is true and q is false, p is false.⁶³

PC8 If $p \rightarrow q$ and $q \rightarrow r$ are true, then so is $p \rightarrow r$.

PC9 If $p \rightarrow r$ and $q \rightarrow r$ are both true, so is $(p \vee q) \rightarrow r$.

PC10 If $p \vee q$ is true and p is false, q is true.

There are also certain statements that are theses of propositional logic. Which of them are taken as axioms and which are to be proven as theorems may vary from one development of propositional logic to another, but all are true in propositional logic.

61. It is common to think of \sim as a connective, even though it does not serve to join two or more propositions. The connectives could instead be called operators, with $\&$, \vee , \rightarrow and \leftrightarrow as binary operators and \sim as a unary operator.

62. This inference scheme is often referred to as *modus ponens*.

63. This inference scheme is often referred to as *modus tollens*.

- PC11 $p \rightarrow (p \vee q)$
 PC12 $(p \& q) \rightarrow (p \vee q)$
 PC13 $\sim(p \rightarrow q) \leftrightarrow (p \& \sim q)$
 PC14 $(\sim p \vee q) \leftrightarrow (p \rightarrow q)$
 PC15 $\sim(p \& q) \leftrightarrow (\sim p \vee \sim q)$
 PC16 $\sim(p \vee q) \leftrightarrow (\sim p \& \sim q)$
 PC17 $p \rightarrow (q \rightarrow (p \& q))$
 PC18 $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \& q) \rightarrow r)$
 PC19 $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$
 PC20 $\sim(\sim p) \rightarrow p$
 PC21 $(p \& q) \leftrightarrow (q \& p)$
 PC22 $(p \vee q) \leftrightarrow (q \vee p)$
 PC23 $(p \rightarrow q) \leftrightarrow ((p \rightarrow q) \& (q \rightarrow p))$

In each of PC1 through PC23, any variable may be uniformly replaced by any formula that makes sense in the logic⁶⁴ and the result will hold true in propositional logic. For example, from PC7 "If $(p \& r) \rightarrow q$ is true and q is false, then $p \& r$ is false" may be derived, and from PC20, $\sim(\sim(\sim p)) \rightarrow p$ is a thesis of propositional logic. This rule of uniform substitution holds true even when a variable is uniformly replaced by a formula involving findings or necessary truths, but substitutions must be made carefully. For example, from PC5, if Fp is false $\sim Fp$ is true, but PC5 does not lead to the conclusion that $F(\sim p)$ is true.⁶⁵

If the logic is to encompass necessary truths, the propositional logic must be expanded to include the basis for a modal logic. One of the simpler modal logics is that presented by Feys⁶⁶ and by von Wright.⁶⁷ Those equivalent systems require the addition of two axioms

64. Making sense in the logic, as opposed to truth or falsity, is a grammatical question. Those propositions that "make sense" are those that are "well-formed", that is, built up according to certain formation rules.

The formation rules for the system presented here are as follow:

Any variable, p , q , r , etc. standing alone is a well-formed formula.

If α is a well-formed formula, so also are $\sim \alpha$, and $L\alpha$.

If α and B are well-formed formulas, so also are $(\alpha \& B)$, $(\alpha \vee B)$, $(\alpha \rightarrow B)$, and $(\alpha \rightarrow B)$.

Where no confusion would result, parentheses may be dropped.

See also *infra* note 75 (giving an additional formation rule).

65. See *infra* notes 150-51 and accompanying text.

66. Feys, *Les Logiques nouvelles des modalités*, 40 REVUE NEOSCOLASTIQUE DE PHILOSOPHIE 517 (1937).

67. VON WRIGHT, *supra* note 44 at 8-28.

and one inference scheme to a basis for propositional logic.⁶⁸ The two modal logic axioms, designated *ML1* and *ML2*, follow.

ML1 $Lp \rightarrow p$. Expressed in more ordinary language, if p is necessary, p is true.

ML2 $L(p \rightarrow q) \rightarrow (Lp \rightarrow Lq)$. Again, in more ordinary language, if p necessarily implies q , then if p is necessarily true, q is necessarily true.

The additional inference scheme, designated *ML3*, provides:

ML3 If p is a thesis, so is Lp .

Since *ML1* through *ML3* are not as intuitively obvious as *PC1* through *PC23*, and since the remainder of the logic depends on their acceptance, some discussion would be beneficial. *ML1* simply states that those things that are necessarily true may be taken as true in the logical system. If a proposition is tautological (and hence is logically true), is necessitated by the way in which linguistic terms are employed (and hence is conceptually necessary), or is such that a juror must take the proposition as true given generally accepted scientific and physical theory (and hence is theoretically necessary), then the proposition may be taken as actually true. Note that the truth of the proposition is dependent on the basis for the necessity. If logic were different, or if linguistic terms were used differently than they are, or if the world were seen as different than the accepted scientific view, the proposition would no longer be necessarily true and need not be actually true. However, it should be assumed that the jury will operate under rules of logic, employ linguistic terms in the way dictated by language,⁶⁹ and operate within scientific or

68. As with propositional logic, various formulations of the particular modal logic under discussion would also be possible. The distinction between axioms and theorems is, therefore, of no greater relevance here than for the propositional logic. However, whereas the theses of propositional logic all seem rather intuitively acceptable, the same may not be true for modal logic. Arguing for the acceptance of the logic is then made easier by arguing for the acceptability of a small number of axioms and inference schemes and then showing that the acceptability of the remaining theses follows logically from the already accepted axioms and inference schemes.

69. There is, of course, always ambiguity in language. But, those instances in which conceptual necessity is properly posited are cases in which there is no room for ambiguity. For example, it is conceptually necessary that a bachelor be unmarried. This is not to say that there will not be questionable cases. For example, even if it is assumed that "all ravens are black" is necessary, it is unclear whether the necessity is conceptual or theoretical. That is, is

physical theory.⁷⁰ Under these assumptions, $Lp \rightarrow p$ would appear to be acceptable.

ML2 may be likened to a strong form of *modus ponens*.⁷¹ It states that if p is necessarily true and p necessarily implies q , then q is necessarily true. If under any conceivable state of affairs, p implies q , and under any conceivable state of affairs p is true, then under each of the conceivable states of affairs, by *modus ponens*, q would be true. So, q is also true under every conceivable state of affairs.⁷²

The additional inference scheme, ML3, states that if a formula can be proven to be a thesis of the logical system, then it may be taken as necessary. In this regard it is important to point out that for a formula to be a thesis, it must be proved without reference to any assumptions, that is, its proof must involve only the axioms and inference schemes.⁷³ Since the formula has been proven to stand without reference to any actual state of affairs, as expressed by hypotheses, the proposition must be true under any possible state of affairs and is, therefore, necessary.

Accepting the additional axioms and the new inference scheme requires the acceptance of the following theorems, which may be proved using propositional logic and the added axioms and inference scheme.⁷⁴

ML4 $L(p \& q) \leftrightarrow (Lp \& Lq)$

ML5 $Lp \rightarrow L(q \rightarrow p)$

ML6 $(Lp \vee Lq) \rightarrow L(p \vee q)$

blackness inherent in the concept of ravenness or is the conclusion inductively based? See SNYDER, *supra* note 46, at 176-77; W. QUINE, FROM A LOGICAL POINT OF VIEW 20-46 (1953).

70. The conclusion, of course, rests on the assumption of the linguistic conventions and the acceptance of the scientific theory. While there may be debate over either, the logic will point out just what propositions must be taken as necessary in any particular analysis. At that point, the work of the logic is done. Any further debate is linguistic or scientific.

71. See *supra* text accompanying note 62.

72. Saul A. Kripke presents a proof of the relative consistency of the axiomatic basis for the modal logic developed thus far. He establishes a set-theoretic model of the system, which proves that any inconsistency in the modal system can only be one that is already present in set theory. See Kripke, *Semantical Analysis of Modal Logic I: Normal Modal Propositional Calculi*, 9 ZEITSCHRIFT FÜR MATHEMATISCHE LOGIK UND GRUNDLAGEN DER MATHEMATIK 67 (1963) [hereinafter Kripke].

73. Since the axioms and inference schemes define the logic, they are logically necessary, and any formula that follows logically from those axioms and inference schemes must also be logically necessary.

74. Proofs of the theorems ML4 through ML10 may be found in G. HUGHES & M. CRESSWELL, AN INTRODUCTION TO MODAL LOGIC 34-40 (1st ed. 2d paperback ed. 1977).

Additionally, if the symbol M , read “possibly”, is added to the logic,⁷⁵ and is defined as $\sim L(\sim p)$, that is, p is possible if and only if $\sim p$ is not necessary, then the following theorems may be proved.

ML7 $Lp \leftrightarrow \sim M(\sim p)$

ML8 $M(p \vee q) \leftrightarrow (Mp \vee Mq)$

ML9 $M(p \& q) \rightarrow (Mp \& Mq)$

ML10 $L(P \rightarrow) \rightarrow (Mp \rightarrow Mq)$

Now that the logic is capable of handling concepts of necessity and possibility, one more extension is all that is required for the logic to be capable of handling findings of fact. The addition of five axioms is required.⁷⁶

ML11 $Lp \rightarrow Fp$

ML12 $\sim (Fp \& F(\sim p))$

ML13 $F(p \& q) \rightarrow (Fp \& Fq)$

ML14 $(Lp \& F(p \rightarrow q)) \rightarrow Fq$

ML15 $(Fp \& L(p \rightarrow q)) \rightarrow Fq$

Since, once again, the axioms presented are not as intuitive as the theses of propositional logic, and since the remainder of the logic depends for its acceptability on the acceptance of the axioms, some discussion is necessary. ML11 states that if p is necessarily true, p is found as fact or must be taken as found as fact. If p is logically necessary, or must be true because of the way in which linguistic terms are used, or is required by well-accepted scientific or physical theory, then p is such that its truth must be accepted by any juror, and the jury may be taken to have found p , or it may be concluded that the jury would have found p had the issue been considered.

ML12 states simply that $\sim p$ and p cannot both be found in the same jury deliberation.⁷⁷ Since even the weakest standard of proof,

75. The additional formation rule required is: If α is a well-formed formula, so also is $M\alpha$. See *supra* note 64.

76. See *supra* note 68.

77. Indeed, this is the problem raised in cases of conflicting findings on special issues. The standard developed by the courts for requiring a new trial goes beyond a simple violation of axiom ML12 and requires a form of materiality. See *infra* notes 96-98 and accompanying text.

proof by a preponderance, requires that the found proposition be more likely than not,⁷⁸ p and $\sim p$ cannot both be found. If both were found, p would be more likely than $\sim p$ and $\sim p$ would be more likely than p . That is, the probability of p would both exceed and be less than the probability of $\sim p$, a clearly unacceptable result.

ML13 states that if $p \& q$ taken together is found then each individually may be taken as found. In any instance in which $p \& q$ is true, p will be true, as will q . Hence, if $p \& q$ proves true in the required proportion of alternative states of affairs, p and q will be true with at least as great a frequency, and each may be taken as found.

ML14 and ML15 allow for inferences to be drawn from findings. Rather than allowing a finding of q to be derived from findings of p and of $p \rightarrow q$,⁷⁹ the logic requires that either p or $p \rightarrow q$ be necessary. Both axioms appear acceptable. ML14 states that if p is necessarily true, and p more likely than not implies q , then q is more likely than not true.⁸⁰ If p must be true, then in any instance in which $p \rightarrow q$ is true, q will also have to be true. If the probability of $p \rightarrow q$ rises to the necessary level, the probability of q will have risen to at least that level⁸¹ and will also have reached the level required for a finding. Similarly, as stated in ML15, if p is found and it is necessary that whenever p is true q is true, then q may be taken as found.⁸²

Having accepted the additional axioms,⁸³ the following theorems follow.⁸⁴

78. See E. CLEARY, MCCORMICK'S HANDBOOK OF THE LAW OF EVIDENCE § 339, at 957 (3d ed. 1984) ("The most acceptable meaning to be given to the expression, proof by a preponderance, seems to be proof which leads the jury to find that the existence of the contested fact is more probable than its nonexistence.").

79. An attempt to imply Fq from Fp and $F(p \rightarrow q)$ would lead to probability level problems similar to those that lead to the rejection of any attempt to derive $F(p \& q)$ from Fp and Fq . See *supra* notes 24-26 and accompanying text. For further discussion of the problem as it relates to implications, see COHEN, *supra* note 21, at 68-73; Saunders, *supra* note 56, at 101-02.

80. Taking findings as established by clear and convincing evidence or proof beyond a reasonable doubt will not change the analysis.

81. In fact, the probability of q will equal the probability of $p \rightarrow q$. Since p is always true, whenever $p \rightarrow q$ is true, so is q . And, whenever q is true, by PC3, $p \rightarrow q$ will also be true.

82. The probability of q may exceed the probability of p but may not be lower, since q must be true whenever p is true and q may also be true without p being true.

83. The Kripke models, see Kripke, *supra* note 72, may be extended to provide a proof of the relative consistency of the extension of the logic provided by ML11 through ML14. See Saunders, *supra* note 56, at 104-05 n.24-26, 108-10 n.33.

84. For proofs of theorems ML15 through ML22, see Saunders, *supra* note 56, at 117 app. 1.

- ML16 $Fp \rightarrow F(p \vee q)$
- ML17 $F(\sim p) \rightarrow \sim Fp$
- ML18 $Fq \rightarrow F(p \rightarrow q)$
- ML19 $F(p \& q) \rightarrow F(p \vee q)$
- ML20 $(F(p \vee q) \& L(\sim p)) \rightarrow Fq$
- ML21 $L(p \rightarrow q) \rightarrow (Fp \rightarrow Fq)$
- ML22 $(Lp \& Fq) \rightarrow F(p \& q)$
- ML23 $Fp \rightarrow Mp$

The addition of the axioms ML11 through ML15 completed the logic,⁸⁵ and led to theorems ML16 through ML23. Armed with the theses of the logic, the cases considering special issue conflicts may be analyzed. But before turning to that task, a brief word on argument techniques would be profitable.

One powerful technique employs what is known as the deduction theorem. The deduction theorem states that if one is attempting to prove a conditional, the proof may proceed by taking the antecedent of the conditional as a hypothesis and from the hypothesis proving the consequent. If the proof of the consequent is completed, the conditional may then be taken as proven. The deduction system does hold in a system using the inference schemes employed here.⁸⁶

A second technique is indirect inference or *reductio ad absurdum*. Indirect inference allows proof of a proposition p by assuming its negation, $\sim p$, and showing that the acceptance of $\sim p$ leads to a contradiction. Similarly, $\sim p$ may be proved by assuming p and showing that such an assumption leads to a contradiction. Indirect inference is also a valid form of reasoning in the logical system.⁸⁷

Lastly, it is permissible to substitute an equivalent formula into any formula that is not a finding.⁸⁸ It is also acceptable to substitute a necessarily equivalent formula into formulas that are findings.⁸⁹

85. Saunders, *supra* note 56, at 112-14 extends the logic to contend with situations in which modalities are iterated, such as *MLp*, *FLMp*, etc. The treatment of iterations is unimportant to the analysis to be undertaken *infra*, but if situations should arise, the axioms and theorems that allow for the inference of simpler modalities are found *id.* at 113-14.

86. See Zeman, *The Deduction Theorem in S4, S4.2 and S5*, 8 NOTRE DAME J. OF FORMAL LOGIC 56 (1967).

87. Indirect inference follows from the deduction theorem in any propositional calculus basis.

88. See G. HUGHES & M. CRESSWELL, *supra* note 74, at 33-37.

89. See Saunders, *supra* note 56, at 111 n.36.

III. RESOLVING SPECIAL ISSUE CONFLICTS

The Texas courts have developed what is, in effect, a two-step test for reversing a judgment due to a fatal conflict between jury findings on material special issues. The first step, which is not generally discussed in the literature nor found to present much difficulty, is identifying the two (or more) findings that conflict.⁹⁰ The second step is showing that the conflict is material. The two findings must not only conflict, but they must also lead to different judgments. Thus, if one finding is accepted and the conflicting finding ignored, one judgment must result, while if the other finding is instead accepted, the opposite judgment must result.⁹¹

While identification of what is to be considered as a conflict, as opposed to a material conflict, may have created no great difficulties, it is important to a logical analysis. That is particularly so when the logic offers more than one combination of propositions that might be viewed as a conflict. In the logic presented here, there are two such combinations. One such case, is equivalent to a contradiction in propositional logic. In such a case, the jury may have been asked if they find p and have answered in the negative. In a separate special issue they may have been asked if they find p , or more likely some finding from which a finding of p may be inferred,⁹² and have answered affirmatively. The result is a conflict between Fp and $\sim Fp$.⁹³

90. The courts do not present the analysis as being in two steps, but must in fact, first identify the findings said to conflict. Where the issues conflict squarely, no logical analysis or discussion of the issue is required. Where the conflict is not so direct, at least some discussion is required. For example, in discerning a conflict between findings that plaintiff and defendant were both negligent and a finding that the accident was unavoidable, the Supreme Court of Texas considered the meaning of "unavoidable accident" and determined that, as a matter of law, it required a lack of negligence on the part of anyone. See *A.B.C. Stores, Inc. v. Taylor*, 136 Tex. 89, 90, 148 S.W.2d 392, 393 (1941). For a complete discussion of *Taylor*, see *infra* notes 112-19 and accompanying text.

91. See *infra* text accompanying note 97.

92. For example, p and $p \& q$ may both have been submitted as special issues, and the jury may have failed to find p but have found $p \& q$. But, $F(p \& q)$ implies Fp , see ML13, so the result is Fp and $\sim Fp$, a contradiction.

The example presents a case of inartful submission of special issues. The two issues should not both have been submitted. Either $p \& q$ should have been the only issue submitted, or p and q could both have been submitted and the conjunction omitted. While inartful, it is not unheard of for one submitted special issue to encompass another. See, e.g., *Traywick v. Goodrich*, 364 S.W.2d 190 (Tex. 1963). For a complete discussion of *Traywick*, see *infra* notes 126-40 and accompanying text.

93. For examples of such conflicts, see *infra* note 149 and accompanying text.

Another sort of conflict arises when the jury has been asked if they find p , and they have answered affirmatively, while in another situation they have answered affirmatively when asked if they find $\sim p$.⁹⁴ Here the contradiction is not a direct contradiction of propositional logic. In symbols, the result is Fp and $F(\sim p)$. The two findings are not negations of each other, and hence there is no pure propositional logic contradiction. There is, however, a contradiction resulting from the combined findings within the logic. While they do not conflict logically with each other, taken in conjunction, they conflict with axiom ML12, which states $\sim(Fp \& F(\sim p))$. Thus, the contradiction that would be intuitively expected to exist between Fp and $F(\sim p)$ ⁹⁵ does transfer into some contradiction in the logic.

Once the conflict is identified, the test for materiality is applied. Not all conflicts between special issue findings will serve to upset a judgment. Rather, the conflict has to be relevant to the verdict. One of the more recent statements of the relevance or materiality test was presented in *Norris v. Branham*.⁹⁶

[T]he Court must consider each of the answers claimed to be in conflict, disregarding the alleged conflicting answer but taking into consideration all of the rest of the verdict, and if, so considered, one of the answers would require a judgment in favor of the plaintiff and the other would require a judgment in favor of the defendant, then the answers are fatally in conflict.⁹⁷

Clearly, two answers may conflict in a logical sense,⁹⁸ but if the conflict does not translate into an effect on the judgment, the judgment will stand.

The test presents an interesting, perhaps intuitive, understanding of the effect of a contradiction within a logical analysis. If p and

94. Again, it is more likely that either Fp or $F(\sim p)$ was hidden in the sense that it was implied by a more complex finding. See *supra* note 92.

95. For a case in which such a situation has been treated as a conflict, see *A.B.C. Stores, Inc. v. Taylor*, 136 Tex. 89, 148 S.W.2d 392 (1941). *Taylor* is discussed more fully *infra* notes 112-19 and accompanying text.

96. 557 S.W.2d 816 (Tex. Civ. App.—El Paso 1977, writ ref'd n.r.e.).

97. *Id.* at 817 (quoting *Little Rock Furniture Mfg. Co. v. Dunn*, 148 Tex. 197, 206, 222 S.W.2d 985, 991 (1949)).

98. p and $\sim p$ conflict in propositional logic. While Fp and $F(\sim p)$ do not directly conflict with each other, taken together the conjunction conflicts with axiom ML13, so Fp and $F(\sim p)$ might reasonably be viewed as conflicting within the logical system in that they cannot both be true. As an aside, it is interesting to note that while p and $\sim p$ cannot both be true, neither may both be false. While Fp and $F(\sim p)$ might both be false, as where the evidence is even, both cannot be true. See *infra* note 150 and accompanying text.

$\sim p$ are both premises of a logical argument or provable in that argument, then absolutely any other proposition may be proved. $(p \& \sim p) \rightarrow q$ is a tautology of propositional logic, no matter for what q may stand or by what it may be replaced. Since the antecedent $p \& \sim p$ can never be true, the conditional $(p \& \sim p) \rightarrow q$ can never be false. But if the contradiction of p and $\sim p$ is taken to be true in a particular argument, then q may be inferred. Hence, once a contradiction enters an analysis, anything may be proved, including that the judgment must be for the defendant and that the judgment must be for the plaintiff.

The test avoids the problem of being able to prove anything from the contradiction by dropping in turn each of the contradictory findings and determining the effect of the remaining finding on the judgment. Thus, if the judgments in the two cases conflict, it is not due simply to the fact that one logical contradiction leads to all other logical contradictions, but rather because the conflicting judgments are logically tied to and paired with the conflicting findings.

The logic may be of help at both stages of the testing of special issue findings for contradictions. First, some logical analysis may be required in determining whether there is any contradiction, relevant to the judgment or not, between the special issues found. If one or both of Fp and $\sim Fp$ or of Fp and $F(\sim p)$ is buried within a more complex finding, the form of the more complex finding must be subjected to logical analysis to determine whether the contradictory findings can be extricated in a form where the conflict still exist. For example, Fp and $F(\sim p \vee q)$ may appear to conflict, since p and $\sim p$ both occur within findings. However, since $F(\sim p)$ may not be inferred from $F(\sim p \vee q)$,⁹⁹ there is actually no contradiction. On the other hand, the logic demonstrates that there is a contradiction between Fp and $F(\sim p \& q)$.¹⁰⁰

A more complex situation is presented by cases in which there is an alleged contradiction between findings that, in form, appear to be Fp and Fq . The argument must be made that the contradiction

99. Since $p \vee q$ is true whenever either p or q or both $\sim p$ and q are true, the probability of $p \vee q$ must be greater than or equal to the probability of either p or of q . Since the probability of p may be less than the probability of $p \vee q$, the fact that the probability of $p \vee q$ is sufficiently high to take $p \vee q$ as a finding, does not guarantee that the probability of p will also be sufficiently high.

100. $F(\sim p \& q)$ implies $F(\sim p)$ by ML13 and PC1.

is actually between a proposition that may be inferred to have been found and one of the actual findings. In such a case, it is important to know what is required to infer the hidden finding. For example, if in addition to Fp and Fq , the court is willing to conclude that it is necessary that Fp imply $F(\sim q)$,¹⁰¹ then $F(\sim q)$ may be inferred and the contradiction with Fq made explicit.¹⁰² The logic leads to an understanding of the unstated premises that would be necessary to develop the contradiction. The court may then examine each of the required premises to determine whether each is acceptable and the contradiction results.

Turning to the second step of the analysis, the logic is also useful in determining the relevance or materiality of the contradiction. For the contradiction to affect the judgment, one result must flow from one of the findings and the opposite judgment from the contradictory finding.¹⁰³ Clearly, whether the judgment flows from the finding in each case is subject to logical analysis. The demonstration for each of the contradictory findings that it leads to one of the two conflicting judgments should be a more or less formal logical demonstration. The more formal the demonstration, the greater the likelihood that any unstated premises in the argument from finding to judgment will be discovered and the acceptability of those unstated premises subject to non-logical legal analysis. An argument within the context of the logic may then be of value in showing that the contradiction is relevant by demonstrating that the opposing judgments do flow from the contradictory findings.

Demonstration of irrelevance is more difficult,¹⁰⁴ but still the logic may be helpful. If the two contradictory findings do not lead

101. Such a conclusion might be based on an explanatory jury instruction that defined p in terms that required $\sim q$, as in defining "trespass" as including the fact that the trespasser not legally possess the property in question. See *supra* note 49 and accompanying text.

The conclusion might alternatively be based on logical, scientific, or physical necessity. See *supra* notes 46-55 and accompanying text. For example, from a finding that defendant was in New York on a particular date and at a particular time, the court could infer a finding that defendant was not in San Francisco at the same time on the same date.

102. A similar analysis might uncover $\sim Fq$ as implicit in Fp and a contradiction with Fq would thereby be made explicit.

103. See *supra* text accompanying note 97.

104. Relevance may be shown by demonstrating that the opposing judgments follow from the contradictory findings. An inability to show that mutually exclusive judgments follow should not, however, serve as the basis for concluding that the contradiction is immaterial. The inability may not be due to irrelevance but rather to the lack of logical ability on the part of the person attempting to construct a logical argument that might be found by another.

to opposing judgments, then either they lead to the same judgment or at least one of the findings does not lead anywhere. Demonstration that the two findings lead to the same judgment is easier in the logic. A logical argument similar to arguments demonstrating the opposite judgments of a relevant contradiction may be used to show the same judgment flowing from each of the contradictory findings. In such a situation, either the other findings were independently adequate to reach the judgment¹⁰⁵ or there were alternative theories supporting the judgment with Fp a part of one theory and $\sim Fp$ or $F(\sim p)$ a part of the other theory.

Showing that one or both of the findings fails to lead anywhere with regard to the judgment or its opposite is not subject to direct argument within the logic. Except in the case where it can be shown that Fp leads to the opposing judgment, it cannot be demonstrated in the logic that a judgment does not follow from Fp . Instead, a metalogical argument¹⁰⁶ must be presented examining the workings of the logic, the premises and the judgment, and demonstrating informally¹⁰⁷ the irrelevance of the finding in question. Alternatively, a model might be developed in which Fp is true and one judgment holds, and another model developed in which Fp is true and in which the opposing judgment holds.¹⁰⁸

To demonstrate how the logic may be of value in special issue conflict analysis, a look at some of the cases in which the problem arises should be of value. The general discussion of the usefulness of the logic in such analysis may become more clear when looked at in action and in context.

IV. A LOOK AT THE CASES

With the required logic now in hand, it would be useful to look at the analysis the courts have employed in considering claims of conflict in special issue findings. This look may serve two purposes.

105. In such a situation, the findings might actually be better viewed as leading nowhere in terms of the judgments involved.

106. A metalogical argument is an argument about the logic rather than an argument within the logic.

107. A metalogical argument may be rigorous and may even be formal within the context of another logic. It will not, however, be a formal logical argument within the logic it is being used to discuss. For example, Section II of this article is a metalogical discussion of the logic presented in that section.

108. See Saunders, *supra* note 56, at 122 app. 2. See also *infra* note 151.

First, the attempt to make the courts' reasoning fit the logic will provide an opportunity to gain additional acquaintance with the logic presented in the earlier sections. Further, attempting to make the courts' reasoning explainable in terms of the logic should help to make clear just what the courts' reasoning was.

While the courts' major conclusions with regard to legal theory in this area¹⁰⁹ have centered on the second prong of testing conflicting issues, the relevance consideration,¹¹⁰ considerable effort has been given in individual cases to applying the first prong, establishing or explaining away a conflict.¹¹¹ Consider first *A.B.C. Stores, Inc. v. Taylor*,¹¹² a rather short opinion in which the greater effort was expended on the first prong of the test. *A.B.C. Stores* involved Taylor's fall over a box of merchandise in the aisle of a store. The jury found that defendant store had been negligent, but also found that plaintiff had been guilty of contributory negligence and further found that the accident had been unavoidable.¹¹³ The Supreme Court of Texas held these findings to be in conflict, noting: "This finding [of unavoidable accident], carrying with it, as it does, the further finding that neither plaintiff nor defendant was guilty of negligence, is in conflict with the finding that plaintiff was contributorily negligent, as well as the finding that defendant was negligent."¹¹⁴

Turning to a logical analysis of this conflict, it would be useful to let *p*, *q*, and *r* stand for the relevant findings, as follows:

- p*: Plaintiff was contributorily negligent.
- q*: Defendant was negligent.
- r*: The accident was unavoidable.

The jury's conclusions may then be expressed as: *Fp*, *Fq*, and *Fr*. There appears to be no conflict among the three findings, but just as the court had to look within one of the findings to establish a conflict, a look at the logical relations between *p*, *q*, and *r* will show the conflict between *Fp*, *Fq*, and *Fr*. The court stated that the finding of unavoidable accident carried with it findings of no negligence on the part of the defendant and no contributory negligence

109. See *supra* text accompanying notes 96-97.

110. See *supra* notes 96-98 and accompanying text.

111. See *supra* notes 92-95 and accompanying text.

112. 136 Tex. 89, 148 S.W.2d 392 (1941).

113. *Id.* at 90, 148 S.W.2d at 393..

114. *Id.*, 148 S.W.2d at 393.

on the part of the plaintiff¹¹⁵ and thus there existed a conflict. For the conflict to be derivable in the logic, the court must have been willing to conclude:

$$(1) L (r \leftrightarrow (\sim p \& \sim q \& s))$$

where s is the conjunction of various other facts, although s might also be empty. From (1) and from PC4, defining equivalence,

$$(2) L((r \leftrightarrow (\sim p \& \sim q \& s)) \& ((\sim p \& \sim r \& s) \leftrightarrow r))$$

may be derived. Since the necessity of a conjunction implies the necessity of each conjunct, ML4 and PC1 yield

$$(3) L (r \leftrightarrow (\sim p \& \sim q \& s)).$$

But, since Fr also obtains, then by ML15, one may conclude

$$(4) F(\sim p \& \sim q \& s).$$

Since finding a conjunction implies finding either conjunct, ML13 and PC1 yield both $F(\sim p)$ and $F(\sim q)$. Fr then conflicts with both Fp and Fq .

The sole premise needed to show the conflict was the proposition presented in (1). So long as the court was willing to assert the necessary equivalence¹¹⁶ of unavoidable accident and a conjunction involving lack of negligence on the part of either party, the remainder of the demonstration of conflict followed logically. The equivalence needed as a premise is not a product of the logic. It must be established by extra-logical means, such as an understanding of the law and how legal terms relate to one another. The court was willing to assert the premise in this case,¹¹⁷ and demonstration of a conflict became clear.

Again, it should be pointed out that the demonstration of a conflict between, or in this case among, special issue findings is only

115. *Id.* at 90-91. 148 S.W.2d at 393.

116. The court could have come to the same conclusion by determining that r necessarily implied $\sim p \& \sim q \& s$ rather than holding that the two are equivalent. Such an approach, which could well be viewed as a fair reading of the case, would simply shorten the logical analysis by allowing the argument to begin with step (3) in the text.

117. 136 Tex. at 90, 148 S.W.2d at 393. *See also* TEXAS PATTERN JURY CHARGES PJC 3.03 (1969).

the first step of the test for upsetting a judgment. Relevance or materiality must still be determined. In *A.B.C. Stores*, the second prong was dispensed with rather quickly. The court simply stated that the finding of contributory negligence would ordinarily require a judgment in favor of the defendant, a judgment the trial court had entered, but that the finding of unavoidable accident conflicted with the finding of contributory negligence, as well as with the finding of negligence by defendant.¹¹⁸ The court held that judgment should not have been entered for defendant and remanded the case for another trial.¹¹⁹

The analytic framework for evaluating the relevance of special issue conflicts, as later stated in cases such as *Norris v. Branham*¹²⁰ and *Little Rock Furniture Manufacturing Co. v. Dunn*,¹²¹ was not employed by the *A.B.C. Stores* court. The court did not omit one of the conflicting findings and determine the judgment required by the remaining finding, and, in turn, do the same for the other conflicting findings, and determine whether there was also a conflict in the judgments that would result.¹²² Rather, the court seemed simply to assume that the conflict was fatal.

It is, of course, true that the 1941 decision in *A.B.C. Stores* preceded by eight years the Texas Supreme Court's adoption of the relevance test as stated in *Little Rock Furniture*. However, *Little Rock Furniture*, in establishing the origins of the test, traced it as far back as a 1937 case of the Texas Court of Civil Appeals, *Howard v. Howard*.¹²³ Thus, a form of the test did exist,¹²⁴ although it had not been adopted by the Supreme Court of Texas at the time *A.B.C. Stores* was decided.

While the failure to apply the relevancy test might then have

118. 136 Tex. at 91, 148 S.W.2d at 393.

119. *Id.* at 91, 148 S.W.2d at 393.

120. 557 S.W.2d 816, 817 (Tex. Civ. App.—El Paso 1977, writ ref'd n.r.e.).

121. 148 Tex. 197, 206, 222 S.W.2d 985, 991 (1949).

122. See *supra* text accompanying note 97.

123. 102 S.W.2d 473 (Tex. Civ. App.—Austin 1937, writ ref'd).

124. The test in *Howard* was stated as "whether taking the finding *alone* in the one instance, a judgment should be entered in favor of the plaintiff; and taking it *alone* in the other, judgment should be entered in favor of the defendant." *Id.* at 475 (emphasis added). If "alone" is read to omit all other findings, the test is different from that currently in use and that adopted in *Little Rock Furniture*. Such a reading would, however, be untenable. Seldom will anything flow from one finding taken in isolation. "Alone" must, instead, be taken as meaning "without the other conflicting finding," and the *Howard* and *Little Rock Furniture* tests seen as differing only as to the words chosen to explain the test.

been due to historical factors, there also exists a difficulty in applying the test to the three findings in *A.B.C. Stores*, since the statement of the test in *Howard* and *Little Rock Furniture* appears to envision a situation in which there were two findings in conflict. By simply asserting that the conflict was fatal, the court avoided the problem of applying the test to three findings, until forced to do so in a later case.¹²⁵

A second case, which turned solely on the first prong of the test and failed to establish a conflict, was *Traywick v. Goodrich*.¹²⁶ *Traywick* grew out of a collision between defendant's truck and plaintiff's automobile. In response to Special Issue No. 9, the jury found that plaintiff "failed to maintain a proper lookout on the occasion in question and that such failure was a proximate cause of the collision."¹²⁷ In response to Special Issue No. 13, the jury found that plaintiff "failed to ascertain or determine that the way was clear for her to enter the intersection, but that such failure was not negligence."¹²⁸ Let *p*, *q*, *r*, and *s* stand for the following propositions:

p: Plaintiff failed to maintain a proper lookout on the occasion in question.

q: Plaintiff's failure to maintain a proper lookout was a proximate cause of the collision.

r: Plaintiff failed to determine if the way was clear to enter the intersection.

s: Plaintiff's failure to ascertain that the way was clear to enter the intersection was negligent.

The finding in response to Special Issue No. 9 was $F(p \& q)$, and the finding in response to Special Issue No. 13 was $F(r \& \sim s)$. ML13 and PC1 then yield Fp , Fq , Fr , and $F(\sim s)$.

There is no obvious conflict between or among any of the findings. What conflict there may be must be due to some relation between *p*, *q*, *r*, and *s*. The Supreme Court of Texas, in concluding that there was no irreconcilable conflict,¹²⁹ considered the relationship

125. Application of the test to three conflicting findings was required in *Bradford v. Arhelger*, 161 Tex. 422, 340 S.W.2d 772 (1960). For a complete discussion of *Bradford*, see *infra* notes 175-87 and accompanying text.

126. 364 S.W.2d 190 (Tex. 1963).

127. *Id.* at 190.

128. *Id.* at 190-91.

129. The court did not explain "irreconcilable conflict," but presumably such a conflict is one which, under examination, proves to be a logical contradiction in one of the forms

between the findings and noted:

Special Issue No. 9 is all-inclusive on the question as to whether the plaintiff kept and maintained the proper observation at all times on approaching, entering into and after she had entered upon the intersection . . . [,while] No. 13 inquires as to her conduct before entering the intersection. That issue is necessarily embraced within but not coextensive with Special Issue No. 9.¹³⁰

There are, of course, various ways in which one issue may be embraced within another, and determining whether there is a conflict requires an examination of how Special Issue No. 13 is embraced in Special Issue No. 9.

The simplest way in which one special issue may be embraced within another is for one special issue to be either a conjunction or disjunction and the other special issue to be one of the conjuncts or disjuncts of the first. More complex embracing might involve conjunctions of disjunctions or disjunctions of conjunctions with the embraced issue as one of the simple propositions of the more complex finding.¹³¹ In addition to these forms in which an issue might be embraced within another,¹³² it is, of course, also possible that neither issue be embraced within the other but for there to be a conflict.¹³³

Fortunately, the embracing in the case at hand appears to be of not too complex a variety, but some analysis is still required to determine the nature, and thus the effect, of the embracing. The court stated that Special Issue No. 9 was all-inclusive as to proper lookout at all times. Thus, p might be viewed as the conjunction $t \& u \& . . . \& z$, where t , u , . . . and z are propositions expressing the conclusion that plaintiff failed to maintain proper lookout at the various times involved. Taking t as the proposition relevant to the

discussed *supra* notes 92-95 and accompanying text. While "irreconcilable" might instead refer to relevance, that did not appear to be the thrust of the court's discussion.

130. 364 S.W.2d at 191.

131. Also included would be situations in which the embraced finding was not a simple proposition. For example, $p \vee q$ is embraced within $(s \vee t) \& (p \vee q)$.

132. Given the relationships between the various connectives, $\&$, \vee , \rightarrow , \leftrightarrow , and \sim , any complex proposition may be written as an equivalent proposition that is either the conjunction of disjunctions in which each disjunct is either a simple proposition, a finding or a necessary proposition or the negation of such a proposition or may be written as a disjunction of conjunctions in which each conjunct is either a simple proposition, a finding or a necessary proposition or the negation of such a proposition. The first form is known as conjunctive normal form of the complex proposition, and the second is known as the disjunctive normal form of the complex proposition. See Blumberg, *Modern Logic*, 5 ENCYCLOPEDIA OF PHILOSOPHY 12, 17 (1967). For a presentation as to how to go about reducing a complex proposition to disjunctive normal form, see G. MASSEY, UNDERSTANDING SYMBOLIC LOGIC 67-71 (1970).

133. The simple cases of Fp and $\sim Fp$ or Fp and $F(\sim p)$ provide examples.

time of entering the intersection, Fp would imply Ft , by ML13 and PC1.

Since Ft does not explicitly conflict with any of the other findings, it too must be examined in order to uncover a conflict. Ft is a finding that plaintiff failed to maintain a proper lookout before entering the intersection. Proper lookout appears to resort to the reasonable person negligence standard. Hence, t might be read as "plaintiff failed to make sure the way was clear to enter the intersection, and such failure was negligent." Thus, t is necessarily equivalent to $r\&s$. So a finding of t implies $F(r\&s)$, and thus Fr and Fs . Fs then conflicts with the Special Issue No. 13 finding of $F(\sim s)$, and a contradiction is established.

As seen another way, p may be viewed as the disjunction of t , u , . . . and z . In that case Fp still implies $F(tVuV . . . Vz)$, but Fp does not imply the finding of any of the disjuncts and specifically does not imply Ft .¹³⁴ Since Ft cannot be derived, neither can Fs and there is no conflict. Since the court concluded that there was no irreconcilable conflict, it appears that the court treated p as a disjunction, although other reasoning in the opinion makes that position less clear.

The difficulty is that the court stated that Special Issue No. 13 was embraced within Special Issue No. 9. If p is treated as a conjunction then Issue 13 is embraced within Issue 9 to the degree the court appears to envision. Since p would be necessarily equivalent to $t\&u\& . . . \&z$, and t is necessarily equivalent to $r\&s$,¹³⁵ p is necessarily equivalent to $(r\&s)\&u\&v . . . \&z$. Hence, Fp implies $F((r\&s)\&u\&v . . . \&z)$, and thus by ML13 and PC1, Fp would imply Fr . Since Fr is not the totality of the finding in Special Issue No. 13, and in fact the remainder of the findings in the special issues conflict, the actual finding of Special Issue No. 9 does not embrace the actual finding of Special Issue No. 13. However, in a logical sense, No. 9, as a submission, does embrace No. 13. Since $F((r\&s)\&u\&v\& . . . \&z)$ implies $F(r\&s)$, a jury answering Special Issue No. 9 in the affirmative would be required by the rules of logic to

134. See *supra* note 99.

135. The necessary equivalence is that drawn from the realm of conceptual or theoretical necessity. Proper lookout over a series of events is a conclusion to be drawn based on proper lookout at each of the events, and failure to keep proper lookout, within the context of legal language, means keeping a lookout at a level that is negligent.

answer Special Issue No. 13 with a similar finding of failure to keep a lookout and negligence. Hence, under the assumption that Special Issue No. 9 is to be treated as a conjunction, Special Issue No. 9 does embrace Special Issue No. 13, and the court is correct in stating that Special Issue No. 13 should not have been submitted.¹³⁶

If, on the other hand, Special Issue No. 9 should have been treated as a disjunction, Special Issue No. 9 does not embrace Special Issue No. 13. A jury that has found $F((r\&s)VuVvV \dots Vz)$ is not logically required to find $F(r\&s)$.¹³⁷ It is, in fact Special Issue No. 13 that embraces Special Issue No. 9, since by ML16, $F(r\&s)$ implies $F((r\&s)VuVvV \dots Vz)$. It is true that a jury that has failed to find $F((r\&s)VuVvV \dots Vz)$ would also be logically required to not find $F(r\&s)$,¹³⁸ but that seems an odd relationship to be characterized as embracing.¹³⁹

The analysis indicates that, if Special Issue No. 9 is treated as a conjunction, then Special Issue No. 9 does, as the court says, embrace Special Issue No. 13, but there is a conflict between the findings. On the other hand, if Special Issue No. 9 is treated as a disjunction, there is, as the court says, no irreconcilable conflict, but Special Issue No. 9 does not embrace Special Issue No. 13. Instead, Special Issue No. 13 embraces Special Issue No. 9. The court is wrong either in asserting that there is no irreconcilable conflict or in asserting that Special Issue No. 9 embraces Special Issue No. 13.

The *Traywick* court's analysis does indicate which choice should be made. "The findings can be reconciled on the basis that [plaintiff] was not negligent in failing to keep a proper lookout while stopped and before attempting to enter the intersection, but that she was guilty of negligence in failing to keep a lookout thereafter."¹⁴⁰ The court states that the finding in Special Issue No. 9 can be based on a finding of improper lookout at any of the times involved. Since

136. See 364 S.W.2d at 191 ("[I]t is clear that No. 13 should not have been given by the court").

137. See *supra* note 99.

138. Since $F(r\&s)$ implies $F((r\&s)VuVvV \dots Vz)$, a jury that did find $F(r\&s)$ would be logically required to find $F((r\&s)VuVvV \dots Vz)$, which the jury failed to do.

139. The most natural way to treat the claim that proposition p embraces proposition q would be that whenever p is true, q must also be true; that is, p implies q . Treating p embracing q as stating that if p is false, so must q be false would be equivalent, by the logical rule of contraposition, to q implies p . It would indeed be odd in such a situation, to say that p embraces q .

140. 364 S.W.2d at 191.

the truth of any of the disjuncts implies the truth of the disjunction, while the truth of even all but one of the conjuncts does not imply the truth of the conjunction, the court's reasoning clearly relies on Special Issue No. 9 being a disjunction.

It must then be concluded that the court's error was in asserting that Special Issue No. 9 embraced Special Issue No. 13. However, the court was correct in noting that there is a logical relationship between the two special issues. It is, however, unclear which of the issues should not have been submitted. If it was only required to establish that plaintiff was negligent through failure to keep a proper lookout at *some* time, then Special Issue No. 9 was the better submission. If, however, there was any importance attached to the *particular* time at which the plaintiff was negligent, Special Issue No. 9 should not have been submitted. Instead, Special Issue No. 13 should have been submitted, along with special issues on negligence at each of the other relevant times.

In *Rhoades v. Castillo*,¹⁴¹ plaintiff's pickup truck was struck by a tractor-trailer driven by defendant Castillo. The jury found defendant negligent, but also found in response to Special Issue No. 14, that plaintiff was driving at an excessive rate of speed and, in response to Special Issue No. 15, found that defendant's excessive rate of speed was a proximate cause of the accident.¹⁴² Complicating the matter was the submission of a third issue regarding a Cadillac that did not collide with either of the other vehicles but played a pivotal role. "Assured clear distance" was defined by the trial court as:

that distance which would be maintained by a driver using ordinary care when following another vehicle, considering the speed of such vehicles and the traffic on and condition of the street, so that the following vehicle can be safely brought to a stop without colliding with the preceding vehicle, or veering into other vehicles, objects or persons on or near the street.¹⁴³

The jury was then asked, in Special Issue No. 18, "Do you find . . . that . . . [plaintiff] failed to maintain an assured clear distance between his vehicle and the white Cadillac vehicle."¹⁴⁴ The jury responded "we do not."¹⁴⁵

141. 488 S.W.2d 528 (Tex. Civ. App.—Waco 1972, writ ref'd n.r.e.).

142. *Id.* at 529.

143. *Id.* at 530-31.

144. *Id.* at 530.

145. *Id.*

The trial court entered a take nothing verdict against all parties,¹⁴⁶ and plaintiff appealed contending that the answers to Special Issues No. 14 and 15 should have been disregarded because they were in conflict with the finding in response to Special Issue No. 18. The court of civil appeals affirmed the judgment of the trial court, but the basis of the affirmance is somewhat unclear. The court did demonstrate that the conflict argued by the plaintiff did not in fact exist,¹⁴⁷ and so the court might be seen as having concentrated on the first prong of the test for the effect of contradictory findings on judgments. However, the court went on to conclude that "the answers in question are not in irreconcilable conflict."¹⁴⁸ With that language, the court appeared to be using "irreconcilable" or "fatal conflict" to express a conclusion with regard to the effect of the conflict on the judgment. Thus, the court might, having already held that the first prong of the test had been met, also be holding that the alleged conflict also fails to meet the second, or relevance prong. However, if the first prong is not met, and there is no conflict, there is no reason to proceed to test the relevance of that nonexistent conflict in the second prong. A logical analysis of the situation and of the court's reasoning should serve to clarify the court's position.

If p stands for the proposition "Plaintiff drove at an excessive rate of speed" and q for the proposition "Driving at an excessive rate of speed was a proximate cause of the accident", then the responses to Special Issues No. 14 and 15 are Fp and Fq , respectively. If r stands for the proposition "Plaintiff failed to maintain an assured clear distance", the response to Special Issue No. 18 was $\sim Fr$. The court's first response to the claim that these findings are in conflict was to note that the negative response to Special Issue No. 18 "is not . . . a finding that [plaintiff] maintained an 'assured clear distance' between the pickup and the Cadillac. Rather, the negative answer to this issue simply means, in law, that the defendants failed to carry their burden of proving the fact inquired about."¹⁴⁹

146. *Id.* The freight line for which defendant Castillo worked was also a defendant in the suit filed by Rhoades and had filed a cross-claim for damage to its tractor. A take-nothing judgment was entered on this cross-claim. *Id.*

147. *Id.* at 531. See also *infra* notes 149-51 and accompanying text (describing the application of logic to the case).

148. 488 S.W.2d at 531.

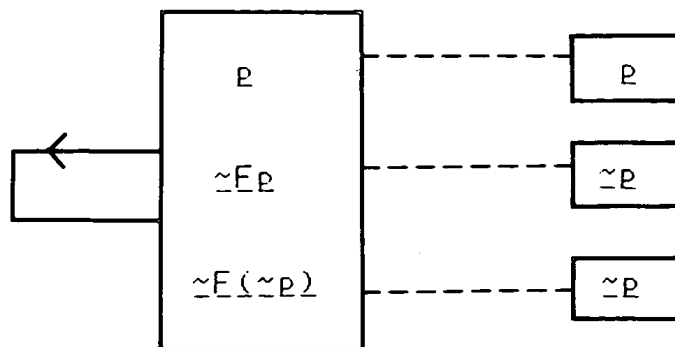
149. *Id.*

The court has identified an important characteristic of the logic. The court's statement is simply that $\sim Fr$ does not imply $F(\sim r)$. If insufficient evidence has been offered to establish that the probability of $\sim p$ is greater than the probability of p , or vice versa, or if the evidence is evenly divided, the two propositions are taken as legally equiprobable.¹⁵⁰ Neither is probable, and neither may be taken as found. Hence, there is the possibility that neither Fp nor $F(\sim p)$ is found, so the fact that r has not been found does not imply that $\sim r$ must have been found.¹⁵¹

While the court is correct in what it says, its first response is not adequate and the second response is needed to show that there is no conflict. The difficulty is that the court appears to conclude that there could be no conflict between $\sim Fr$, on the one hand, and Fp and Fq on the other. However, if Fp and Fq may be shown to imply Fr , there would be a contradiction. Similarly, if Fp and Fq can be shown to imply Fs , while $\sim Fr$ implied $\sim Fs$ or $F(\sim s)$, there would also be a contradiction. The remainder of the court's discussion should then be taken, not as stating that even had there been a contradiction it would not have been relevant, but rather as

150. Where proof is by clear and convincing evidence, or as in a criminal case, beyond a reasonable doubt, the middle ground in which neither p nor $\sim p$ may be taken as found is expanded. The two propositions need not be equiprobable. If one merely has a probability somewhat in excess of one-half, the proposition may not be taken as found, and clearly its negation, the probability of which would be somewhat less than one-half, also could not be taken as found.

151. Showing that a proposition, in this case $\sim Fr \rightarrow F(\sim r)$, does not hold in the logic is not subject to proof within the logic, except where it can be shown that the proposition's negation is a thesis. The demonstration that a proposition does not hold in a logic may be accomplished by showing that the proposition may be false in a model of the logic. The model for the logic presented here may be found in Saunders, *supra* note 56, at 104-05 nn.24-26, 108-10 n.33. Within that model, the following diagram shows a world having access to itself and three other alternative states of affairs. Since p is true in two of the states of affairs or worlds and $\sim p$ is also true in two worlds, Fp and $F(\sim p)$ are both false. Since $\sim Fp$ is true in a world, while $F(\sim p)$ is false, $\sim Fp$ does not imply $F(\sim p)$.



an examination of the content of p , q , and r to be sure that there is no implied or derivable contradiction. Before showing how the court's language should be read as making such an effort, it would be useful to use the logic to show that there is, in fact, no implied contradiction and that the court was correct in its conclusion despite the lack of clarity in the direction of its analysis.

To examine the possibility of any derived contradiction, the propositions that were found, and that which was not, must be examined for implications. Fp was a finding that plaintiff was traveling at an excessive rate of speed. An "excessive rate of speed" would appear to require not just traveling at or in excess of some particular speed but also that the rate be one at which the reasonable person would not travel, so that travelling at that rate is negligence. Hence, p is necessarily equivalent to $s\&t$, where t expresses some conjunction of facts regarding the rate of speed and s concludes that the rate expressed in t was negligent. Since p is necessarily equivalent¹⁵² to $s\&t$, $s\&t$ may be substituted for p , and the response to Special Issue No. 14 becomes $F(s\&t)$ which by ML13 and PC1 yields Fs .

Turning to Special Issue No. 18, the jury did not find that plaintiff failed to maintain an assured clear distance. Under the court's explanation of "assured clear distance", such a failure to maintain would be based on certain conditions of closeness, expressed as u , which may be a conjunction, and lack of ordinary care, expressed as v . Since r is necessarily equivalent¹⁵³ to $u\&v$, the response to Special Issue No. 18 may be expressed as $\sim F(u\&v)$.

It now becomes clear what more would be required for there to be a contradiction between the findings in Special Issues No. 14 and 18. First, from $\sim F(u\&v)$, $\sim Fv$ or $F(\sim v)$ would have to be derivable. Second, $\sim Fv$ or $F(\sim v)$, would have to conflict with Fs . The court's discussion of the case may be taken as following the second route. The court states:

The jury may have determined that inasmuch as [plaintiff] did not collide with the Cadillac the preponderance of evidence does not show that he was less than an assured clear distance from it.

In light of the record, the jury's answer to issue 18 must be considered generous to [plaintiff]; but it does not inhibit or conflict with determinations by the jury, permissible under the record,

152. The necessity of the equivalence is the conceptual necessity present in the explanation of how terms are used in a legal context. See *supra* notes 48-50 and accompanying text.

153. See *supra* note 152.

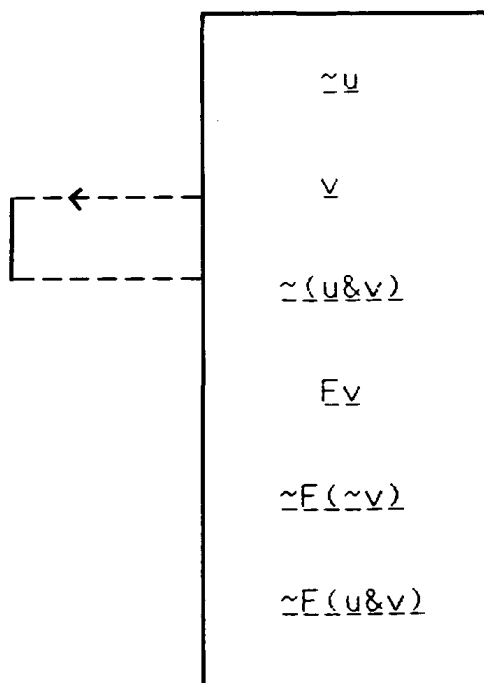
that his speed was too fast to enable him to maintain control of his vehicle when and after he attempted to turn and slow it, and that the speed was therefore imprudent and a contributing cause of the collision.¹⁵⁴

The explanation is that the negligence expressed in s and that expressed in v are not the same in that they regard different acts or conditions. The finding that plaintiff was traveling at a negligently high rate of speed may have been based on conditions other than the proximity of an automobile in front of plaintiff, so a failure to find v or a finding of $\sim v$ would not necessarily conflict with a finding of s .¹⁵⁵ Furthermore, neither $\sim Fv$ nor $F(\sim v)$ is derivable from $\sim F(u \& v)$.¹⁵⁶ Under either approach, the court was correct in

154. 488 S.W.2d at 531.

155. The finding expressed as Fs might be viewed as a finding that plaintiff's rate of speed was excessive for some reason. That is, plaintiff was negligent in driving at some rate because of road conditions, proximity of other vehicles, condition of plaintiff's automobile, time of day or night, weather, or any of a number of other reasons. The finding $\sim Fv$ or $F(\sim v)$, if it could have been derived, *see infra* note 156 and accompanying text, would only have eliminated one of the bases for finding Fs and would not have been in conflict with Fs . The analysis would have been similar to that presented in *Traywick v. Goodrich*, 364 S.W.2d 190 (Tex. 1963). For a discussion of *Traywick* see *supra* notes 126-40 and accompanying text.

156. A counter example, constructed within the model, see Saunders, *supra* note 56, at 122 app. 2, demonstrates the non-derivability.



In this case, a one world model suffices. Since u is false, $(u \& v)$ is false. Hence, $(u \& v)$ is not found in this single possible state of affairs; that is, $\sim F(u \& v)$ is true. However, since v is

concluding that there was no conflict, and the entire discussion must be taken as attempting to show that there was no contradiction rather than as an examination of the relevance of an existing contradiction.

A case in which the Texas Supreme Court's analysis clearly turned on the issue of relevance of a contradiction was presented by *Texas & Pacific R.R. Co. v. Snider*.¹⁵⁷ In *Snider*, suit was brought against the railroad for wrongful death of plaintiff's husband in a crossing accident. Judgment in the trial court was for the railroad, but the Texarkana Court of Civil Appeals reversed the judgment and remanded for retrial in part on the basis of an irreconcilable conflict in jury findings.¹⁵⁸ In reversing the court of civil appeals and affirming the judgment of the trial court, the Texas Supreme Court examined the alleged conflict, found that there was indeed a contradiction, but held that the conflict was not irreconcilable.¹⁵⁹

The responses, expressed as findings, to thirteen of the special issues submitted are set out below. The numeral preceding the finding keys the finding to the special issue submission.

17: *Fp p*: The train was plainly visible.

18: *F(¬q) q*: The train was in hazardous proximity when plaintiff was fifteen feet away.

23: *Fr r*: The train was within 1500 feet when plaintiff was more than fifteen feet but less than fifty feet away.

24: *Fs s*: The train was emitting a signal.

25: *Ft t*: The train was in hazardous proximity before plaintiff was fifteen feet away.

26: *Fu u*: Plaintiff stopped more than fifteen but less than fifty feet away from the crossing.

27: *Fv v*: After stopping, plaintiff proceeded, when it was not safe to do so.

28: *Fw w*: Proceeding when it was not safe was a proximate cause of the accident.

38: *Fx x*: Plaintiff saw the train before driving onto the track.

39: *Fy y*: Driving onto the track after seeing the train was contributory negligence.

true, and $\sim v$ is thus false, Fv and $\sim F(\sim v)$ are both true, so neither $\sim Fv$ nor $F(\sim v)$ is derivable from $\sim F(u \& v)$ in the logic.

157. 159 Tex. 380, 321 S.W.2d 280 (1959).

158. 315 S.W.2d 82 (Tex. Civ. App.—Texarkana 1958), *rev'd*, 159 Tex. 380, 321 S.W.2d 280 (1959).

159. 159 Tex. at 383-84, 321 S.W.2d at 282-83.

43: *Fz z*: Plaintiff heard the train before driving onto the track.

44: *Fa a*: Driving onto the track after hearing the train was contributory negligence.

47: *Fb b*: Failure to stop and wait for the train before driving onto the track was contributory negligence.

The court recognized that there was a conflict between the answers to Special Issues No. 18 and 25.¹⁶⁰ The response to Special Issue No. 18 was that the train was not in hazardous proximity at the time plaintiff was fifteen feet from the crossing, while the answer to Special Issue No. 25 was that the train had been in hazardous proximity before the plaintiff was fifteen feet from the crossing.¹⁶¹ While there is no direct conflict between $F(\sim q)$ and Ft , an examination of the relation between t and q reveals a conflict. Unless either plaintiff's automobile or defendant's train was moving away from the crossing at the time in question, a suggestion belied by the fact that they collided at the crossing, the fact that they were hazardingly close when plaintiff was more than fifteen feet from the crossing, gives rise to the assumption that they were at least as close at the point when plaintiff was fifteen feet from the crossing. The court must be willing to conclude that t necessarily implies q .¹⁶² If so, from $L(t \rightarrow q)$ and Ft , Fq may be derived through ML15. Hence, a contradiction with $F(\sim q)$ from Special Issue No. 18 is derived.

Since there is a conflict, the materiality of the conflict must be considered. It must be determined whether the conflicting findings would lead to different judgments, when taken in conjunction with the other non-conflicting findings.¹⁶³ That is, it must be determined whether:

(1) $Fp \ \& \ Fr \ \& \ Fs \ \& \ Ft \ \& \ Fu \ \& \ Fv \ \& \ Fw \ \& \ Fx \ \& \ Fy \ \& \ Fz$
 $\& \ Fa \ \& \ Fb$

and

160. *Id.* at 382, 321 S.W.2d at 282.

161. *Id.* at 382-83, 321 S.W.2d at 282.

162. The necessity involved here would appear to be a combination of conceptual and theoretical. See *supra* notes 48-53 and accompanying text. First, conceptual necessity provides the explanation that "hazardous proximity" means "too close given the circumstances of events". Second, physical or scientific theory provides the theoretical necessity that objects that are already too close and are getting closer remain too close, assuming of course, that there is not a change in the conditions or events that made the objects too close in the first place.

163. See *supra* text accompanying note 97.

(2) $Fp \ \& \ F(\sim q) \ \& \ Fr \ \& \ Fs \ \& \ Fu \ \& \ Fv \ \& \ Fw \ \& \ Fx \ \& \ Fy \ \& \ Fz \ \& \ Fa \ \& \ Fb$

lead to different judgments.

The court addressed this question by noting that the findings in response to Special Issues No. 18 and 25 were only relevant to a statutory duty to stop between fifteen and fifty feet from a crossing and not proceed until it was safe to do so.¹⁶⁴ The court noted that whether the train was or was not in hazardous proximity, plaintiff did stop within the required distance, as the jury found in response to Special Issue No. 26. Thus, whether plaintiff stopped in order to comply with the statute, or for any other reason, he did in fact comply with the statute by stopping within the required distance. The court also noted that having stopped, there was a common law duty of ordinary care not to proceed until it was safe to do so.¹⁶⁵ Fv established that plaintiff had violated that common law duty, and Fw established that the violation was a proximate cause of the accident.

The conjunction $Fu \& Fv \& Fw$ is then adequate to establish contributory negligence. Since $Fu \& Fv \& Fw$ may be derived from either (1) or (2), through PC1, contributory negligence is established without regard to the conflict between the responses to Special Issues No. 18 and 25. This is true because, in either case, accepting either (1) or (2), plaintiff's contributory negligence leads to a judgment for the defendant, and thus, the conflict is not material.

*Little Rock Furniture Manufacturing Co. v. Dunn*¹⁶⁶ presents an interesting case in which the court noted a conflict between findings in response to special issues and in which a logical look demonstrates

164. 159 Tex. at 383, 321 S.W.2d at 282. The statute provided:

Whenever any person driving a vehicle approaches a railroad grade crossing, the driver of such vehicle shall stop within fifty (50) feet but not less than fifteen (15) feet from the nearest rail of such railroad and shall not proceed until he can do so safely when:

...

(c) A railroad engine approaching within approximately fifteen hundred (1500) feet of the highway crossing emits a signal audible from such distance and such engine by reason of its speed or nearness to such crossing is an immediate hazard;

(d) An approaching train is plainly visible and is in hazardous proximity to such crossing.

TEX. REV. CIV. STAT. ANN. art. 6701d, § 86 (Vernon 1977).

165. 159 Tex. at 383, 321 S.W.2d at 282.

166. 148 Tex. 197, 222 S.W.2d 985 (1949).

that one of the findings is in itself logically unacceptable. In *Little Rock*, plaintiff's automobile ran into defendant's truck from behind while the truck was stopped partially on the paved portion of the highway. Defendant contended that plaintiff Dunn had been contributorily negligent, and in response to special issues submitted on that question conflicting answers were returned.

Special Issue No. 15 asked: "Do you find . . . that . . . [plaintiff] failed to keep a proper lookout for his own safety?"¹⁶⁷ The jury answered in the affirmative. Special Issue No. 16 asked: "Do you find . . . that [plaintiff's] failure to keep a proper lookout, if you have so found, was negligence, as that term has been defined to you herein?"¹⁶⁸ In response, the jury answered "no." In the instructions and the charge, the court defined "proper lookout" as "such a lookout as an ordinarily prudent person would have kept under the same or similar circumstances."¹⁶⁹

In examining the response to Special Issue No. 15, the court noted that "[i]t is apparent that, considering the definition the court gave of 'proper lookout,' the effect of the jury's answer to Special Issue No. 15 was that [plaintiff] was negligent."¹⁷⁰ While the jury did not state that plaintiff was contributorily negligent in response to Special Issue No. 15, the court seemed willing to conclude that such a finding follows legally and logically from the jury's finding. Symbolizing the relations between the propositions may help make clear the conclusion.

If p stands for "Plaintiff failed to keep a proper lookout", then p is necessarily equivalent¹⁷¹ to $q \& r$, where r is a conjunction describing the lookout, or lack thereof, that was kept, and q states that the lookout in r was negligent. Since p and $q \& r$ are necessarily equivalent, the response to Special Issue No. 15, Fp , may be replaced by $F(q \& r)$. Then, through ML13 and PC1, Fq may be derived. The court found a conflict between Fq and the response to Special Issue No. 16, which it characterized as also being a finding on negligence. Since the negligence in Special Issue No. 16 would also be with regard to

167. *Id.* at 200, 222 S.W.2d at 987.

168. *Id.*, 222 S.W.2d at 988.

169. *Id.* at 201, 222 S.W.2d at 988.

170. *Id.* at 202, 222 S.W.2d at 988.

171. The necessity would be the conceptual necessity involved in the relationship between legal terms. See *supra* notes 48-50 and accompanying text.

the lookout inquired into in Special Issue No. 15, the finding would be $\sim Fq$,¹⁷² and there would be a contradiction.

The court resolved the conflict question on materiality grounds. Despite the conflict, the findings do not lead to differing judgments. The failure to find contributory negligence in response to Special Issue No. 16 would lead to judgment for the plaintiff. The finding of contributory negligence included in the response to Special Issue No. 15 would not, however, lead to judgment for the defendant. The difficulty for defendant is found in the fact that Special Issue No. 17, regarding proximate cause, was submitted conditionally, only to be answered if Special Issue No. 16 was answered in the affirmative, and thus, was not answered. Since there was no finding of proximate cause, the findings do not lead to different judgments. The conflict was not material, and the judgment could stand.¹⁷³

Looked at from a logical point of view, the case presents an additional problem. Special Issue No. 16 asks the jury, in effect, "Do you find that failure to keep a proper lookout is negligence?" This, in itself presents a problem, since the jury is asked not to make a factual finding but rather to come to a conclusion of law, and when the meaning of "proper lookout" is inserted, the logical problem becomes clear. "Proper lookout" was defined so as to include negligence, $q \& r$ in the symbols that were employed. In asking the jury whether it finds that failure to keep a proper lookout was negligent, the jury was in effect being asked to determine whether $F((q \& r) \rightarrow q)$ is true or false. That question presents one problem, and the answer presents another.

The problem with the question is that it asks not a question of fact but rather one of logic. The logical question is tied to the legal question of whether failure to keep a proper lookout is negligence, because the conceptual necessity that leads to the answer to the logical question is based on the legal definition of "proper lookout". Special issues are questions concerning facts, and this pure question of law should not have been submitted.¹⁷⁴ A similar conclusion would

172. The question was "Do you find . . . ?" and the answer was "No." 148 Tex. at 200-01, 222 S.W.2d at 987-88. The symbolization would be $\sim Fq$. If the question had been "Was . . . ?" and the answer "No," the symbolization might then have been $F(\sim q)$.

173. 148 Tex. at 206, 222 S.W.2d at 991.

174. The questions may be broad or narrow and more or less global. See Spradley, *supra* note 6. However, "[i]n the special issue charge, the judge formulates a series of specific *fact* issues . . ." Note, *The Scope of Special Issues*, *supra* note 3, at 736 (emphasis added). An issue involving no facts should not be submitted.

appear mandated with regard to the submission of a question of logic.

The problem with the answer, from a logical point of view, is that it is wrong. Having concluded that it is conceptually necessary that failure to keep a proper lookout is negligence, the jury must find that failure to keep a proper lookout is negligence. That is, since $L((q \& r) \rightarrow q)$, by ML11, $F((q \& r) \rightarrow q)$ must be true. The jury cannot, within the bounds of logic, fail to find $(q \& r) \rightarrow q$.

The response to Special Issue No. 16 should be ignored, not because of any inadequacy of evidence to support it, although clearly no evidence *could* support such a finding, but on the grounds of the logical impossibility of the finding. There would then be no conflict. The response to Special Issue No. 15 should stand, although without any answer to Special Issue No. 17, the judgment would not be affected.

V. DEALING WITH MULTIPLE CONFLICTS

*Bradford v. Arhelger*¹⁷⁵ raises the question of how courts should cope with more than two conflicting responses to special issues. *Bradford* is not the first case in which such a situation presented itself, since *A.B.C. Stores, Inc. v. Taylor*¹⁷⁶ presented the same combination of findings. However, *Bradford* provided an extensive discussion of the problem that had been lacking from the *A.B.C. Stores* opinion.

In *Bradford*, the jury found that the defendant had been negligent in the operation of a motor vehicle and that such negligence was a proximate cause of the collision at issue. The jury also found that the plaintiff had been negligent in operating his automobile and that plaintiff's negligence had been a proximate cause of the collision. Finally, the jury found that the collision was an unavoidable accident. Plaintiff moved for mistrial on the basis of irreconcilable conflict in the findings, but the trial court denied plaintiff's motion and entered judgment for the defendant. The trial court's judgment was affirmed by the court of civil appeals.

Letting q represent defendant's negligence and proximate cause,

175. 161 Tex. 427, 340 S.W.2d 772 (1960).

176. 136 Tex. 89, 148 S.W.2d 392 (1941). For a discussion of the court's analysis in *A.B.C. Stores*, see *supra* notes 112-25 and accompanying text.

the first finding is symbolized as Fq . Letting p represent plaintiff's negligence and proximate cause, the second finding is symbolized as Fp . The third finding, that the collision was an unavoidable accident, must include findings that neither plaintiff nor defendant was negligent. That finding may be symbolized as $F(\sim p \& \sim q)$. Since by ML13, $F(\sim p \& \sim q)$ implies $F(\sim p) \& F(\sim q)$, and by PC1, $F(\sim p) \& F(\sim q)$ yields $F(\sim p)$ and $F(\sim q)$, there is clearly a contradiction (or there are contradictions) between (or among) the finding of unavoidable accident and the findings regarding negligence.

The court treated the case as presenting two conflicts, one between unavoidable accident and defendant's negligence and the other between unavoidable accident and plaintiff's negligence. The court then applied the materiality test to each of the conflicts. Since the first conflict was seen as between $F(\sim p \& \sim q)$ and Fq , the court first disregarded $F(\sim p \& \sim q)$ and considered Fq with all the rest of the verdict. Since the verdict included Fp , the findings included contributory negligence, and the judgment would have to be for defendant. The court then disregarded Fq and considered $F(\sim p \& \sim q)$ along with the rest of the verdict, a verdict which included Fp . The court concluded that since the rest of the verdict included no finding that the defendant was negligent, judgment would have still be found for defendant.¹⁷⁷

The court then considered the second conflict, that between $F(\sim p \& \sim q)$ and Fp . It first disregarded $F(\sim p \& \sim q)$ and considered Fp along with the rest of the verdict. Since Fp established plaintiff's contributory negligence, judgment would have to be for defendant. The court then disregarded Fp , and considered $F(\sim p \& \sim q)$ along with the rest of the verdict, including Fq . The court noted that these two findings were themselves in fatal conflict and would not support a judgment for either party.¹⁷⁸

The court was then left with a situation in which application of the materiality test resulted in four combinations, three of which

177. Perhaps a better approach, with the same result, would have been to recognize that there would still be a conflict between $F(\sim p \& \sim q)$ and Fp , since $F(\sim p)$ is derivable from $F(\sim p \& \sim q)$, and to apply the materiality test. Disregarding $F(\sim p \& \sim q)$ and accepting Fp , judgment would be for defendant on a contributory negligence basis. Disregarding Fp and accepting $F(\sim p \& \sim q)$, judgment would also be for defendant on the basis of unavoidable accident. Since the judgment would be the same under either branch, the conflict could be disregarded, and the conclusion of each branch, judgment for defendant, could be taken as the result in the main branch under consideration.

178. For an alternative approach and conclusion, see *infra* text accompanying note 181.

would require judgment for the defendant with the fourth leading to no judgment. Despite the fact that the materiality test looks toward judgment in favor of one party in one case and the opposite party in the other, the court concluded that the test itself is met when its application leads to a situation in which judgment may not be entered for either party. On that basis the court reversed and remanded.

The dissent took a different view as to the nature of the conflict. While stating the three findings in conflict in its description of the case, the dissent treated the case as involving a single conflict, stating: "While we are concerned with three separate findings, actually the conflict consisted in the findings that both parties were negligent and that neither party was negligent."¹⁷⁹

Given this view of the conflict, the dissent simply applied the materiality test. Disregarding $F(\sim p \& \sim q)$ and accepting the rest of the verdict, including what it seemed to treat as $F(p \& q)$, judgment would be for the defendant on a contributory negligence basis. Disregarding $F(p \& q)$ and accepting the rest of the verdict, including $F(\sim p \& \sim q)$, judgment would be for the defendant, since the accident was unavoidable. Since judgment would be in favor of the defendant in either case, the findings were not in fatal conflict, and the judgment for the defendant could be affirmed.

There are difficulties presented by both the majority and the dissenting approach, but the more serious difficulty is presented by the dissent. The dissent, in treating the conflict as being between two findings, assumes the equivalence of the set of findings Fp , Fq , $F(\sim p \& \sim q)$ and the set of findings $F(p \& q)$, $F(\sim p \& \sim q)$. That assumption rests on the equivalence of Fp and Fq to $F(p \& q)$. But, the unacceptability of deriving $F(p \& q)$ from Fp and Fq was what led to the rejection of propositional logic as inadequate for the analysis of findings in the first place.¹⁸⁰ Hence, it is only through an error of logic that the dissent is able to conclude that each of the, in its view two, conflicting findings led to judgment for the defendant and that, therefore, the conflict was not material.

The difficulty with the majority approach, as stated, is simply that it did not go far enough. The majority concluded that in three cases, judgment was for the defendant and in one case there could be no judgment.¹⁸¹ This should probably be taken as a recognition

179. 161 Tex. at 431, 340 S.W.2d at 775 (Culver, J., dissenting).

180. See *supra* notes 21-26 and accompanying text.

181. 161 Tex. at 429, 340 S.W.2d at 774.

that in the fourth case, disregarding Fp and taking Fq and $F(\sim p \& \sim q)$, there was still a conflict. If, however, both branches of that conflict had led to judgments for the defendant, there would be no reason why judgment for the defendant could not stand.

The materiality test should have been applied a second time to the conflict between Fq and $F(\sim p \& \sim q)$, remembering of course that Fp had already been disregarded. Disregarding Fq and accepting $F(\sim p \& \sim q)$, judgment would be for the defendant on the basis of unavoidable accident. However, disregarding $F(\sim p \& \sim q)$ and accepting Fq , judgment would be for plaintiff, since Fp had already been disregarded. Hence, the materiality test did not need to be changed to include a situation in which one branch led to no judgment. The court merely needed to recognize that in some situations a second application of the test, and a second branching, might be required. The test would then be that if any two branchings led to judgments for the opposing parties, the judgment could not stand.

It should be clear from the differing conclusions reached by the majority and the dissent that how the findings are grouped can profoundly affect the result. The dissent, by inappropriately combining two of the findings, created a single conflict between two findings and concluded that the conflict was not fatal. The majority, while committing no logical error did not carry the test as far as it might have. Although the majority rendered the correct conclusion, it might have based the conclusion on the fact that one of the second level branches led to a judgment for plaintiff, while all the other branches led to judgment for the defendant, instead of relying on the theory that one branch reached no result.

There is another approach that would ensure that all possible combinations of the conflicting findings are considered.¹⁸² The first step is to take any finding of a conjunction and, through ML13, break it down to findings of each conjunct.¹⁸³ Thus, the findings in *Bradford* would be taken as Fq , $F(\sim p)$ and $F(\sim q)$. The findings are

182. For another attempt at listing combinations of conflicting findings, see Note, *Procedure-Special Issues-Conflicting Answers*, 15 Sw. L.J. 460 (1961).

183. Some information is, of course, lost in deriving Fp and Fq from $F(p \& q)$. $F(p \& q)$ indicates that p and q occur together in the required proportion of alternative states of affairs, while Fp and Fq indicate merely that each occurs in the required proportion of alternative states of affairs. In determining the materiality of conflicts, however, that should make no difference. The conjunction leads to a conflict, even if it is not equivalent to the conflict, and that should be enough to make the conflict material.

then paired with their conflicting findings, Fp with $F(\sim p)$ ¹⁸⁴ and Fq with $F(\sim q)$. All the combinations taking one of each pair are then listed, and the judgment for each combination is determined:

Fp and Fq : defendant
 Fp and $F(\sim q)$: defendant
 $F(\sim p)$ and Fq : plaintiff
 $F(\sim p)$ and $F(\sim q)$: defendant

If the judgments differ at all, the conflict is fatal.

While the method suggested leads to the majority conclusion, and while the additional branching suggested to improve the majority analysis would be similar in effect to this combinatorial approach, the value of the approach would be found in more complex examples. Suppose findings of Fp , $F(q \& \sim r)$, $F(\sim p \& \sim q)$, and $F(r \& \sim p)$. The combinations of findings for application of the traditional materiality test might be difficult to handle. However, breaking the conjunctions down and pairing the conflicting findings¹⁸⁵ would result in Fp and $F(\sim p)$, Fq and $F(\sim q)$, and Fr and $F(\sim r)$. It is then relatively simple to list the eight combinations that result from taking one of each pair, and the judgment could be examined for each combination.

If one of the findings involves a disjunction, it is important to recognize that it may not be broken down into its disjuncts. That is, from $F(p \vee q)$, $F(\sim p)$ and $F(\sim q)$, the pairs Fp , $F(\sim p)$ and Fq , $F(\sim q)$ may not be derived.¹⁸⁶ But even where there is a disjunction buried within a conjunction, breaking down the conjunction and pairing any conflicting conjuncts will simplify the problem, even though one of the paired conjuncts will be a disjunction.¹⁸⁷

184. Fp might in another example end up paired with $\sim Fp$.

185. If one of the conjuncts does not have a conflicting finding, it is not considered in determining the combinations involved. However, it is still considered along with all the rest of the verdict in determining the judgment arrived at for each combination.

186. There are, in fact, no conflicting findings here, since all three may be true at the same time. See *supra* notes 27-33 and accompanying text.

187. The negative of the conjunction $Fp \vee Fq$ would be $\sim (Fp \vee Fq)$ which might also be written as $\sim Fp \& \sim Fq$. If written in the latter form, it would have been broken down to $\sim Fp$ and $\sim Fq$, and it would be difficult to see the pairing with $Fp \vee Fq$. If $\sim Fp$ and $\sim Fq$ are both already paired with Fp and Fq , $Fp \vee Fq$ may be disregarded, since stronger findings of Fp and Fq are already considered in the analysis. If $\sim Fp$ and $\sim Fq$ are not both already paired and originally were present as a conjunction, they should be recombined and paired with $Fp \vee Fq$.

In breaking complex findings down to more simple components for combination in cases of multiple conflicting findings, the logic will be of value. For example, it is not immediately clear that a failure to find a disjunction of two purported facts might be broken up into the failure to find each disjunct. Yet, since by ML16, Fp implies $F(p \vee q)$, by contraposition, $\sim F(p \vee q)$ implies $\sim Fp$. Similarly, $\sim Fq$ could be derived.

CONCLUSION

This article has presented a formal logic that may be employed in the analysis of special issue conflicts. While practitioners are perhaps unlikely to employ the formal analysis presented with any great regularity, the analytic tools are now in place to be used when complexity makes informal analysis unacceptably cumbersome. Perhaps more importantly, reading the formal analysis both necessitates and provides a vehicle for developing a better informal understanding of the nature of special issue conflicts. This increased informal understanding and some of the specific suggestions offered in the formal analysis should lead to an improved jurisprudence of special issue conflicts.

